TECHNOLOGY

August 1957

approach

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THE NAVAL AVIATION SAFETY REVIEW

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LANDING THE A4D—
FIGHTING WHEEL FIRES—
IS 100% OXYGEN TOXIC?

ON THE COVER—

Artist Ted Wilbur has captured the sleekness of the Skyhawk. Despite its stork-like appearance in the groove, the A4D becomes most dynamic when it tucks up the gear. And who can deny that the stork does indeed perform a vital delivery service?

Cover by LT E. T. Wilbur

Anymouse and Headmouse often assist in special projects of the Naval Aviation Safety Center. For this reason they would like from you any ideas and experiences not previously reported concerning . . .

- √ slow flight experiences, training procedures—
- √ mirror landing systems—
- √ complaints on use of guard channel for non-emergency items—
- √ ideas on improvement of instrument training procedures, and utilization of and benefit from procedure trainers, flight simulators, instrument trainers—
- √ comments on various carrier flight deck marking as to lineup for pilots, LSO, etc.—

P.S. Just because these specific topics were mentioned, don't forget to send a report on anything you've learned that you think will benefit others—Your Pals, A & H

Letters to the Editor

Approach welcomes letters from its readers. Send yours either . . . via official channels or direct on Anymouse forms. All letters should be signed. However, names will be withheld on request.
Address: Approach Editor, U. S. Naval Aviation Safety Center, NAS Norfolk 11, Virginia.

CAN 'DE'

Sir:

I hereby have the honour to request your permission to print an adapted translation of Primer for Pilots No.'s 5 and 6, "Drag" and "Region of Reverse Command" (*Approach*, Jan. and Feb. 1956), in the Netherlands Naval Aviation Quarterly "Vleugels can de Vloot"— . . .

J. H. C. ALTING
LCDR RNethNavy
The Hague

Go, ahead!—Ed.

Vol. 3 No. 2 August 1957

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This periodical contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders or directives unless so stated. Material extracted from Aircraft Accident Reports, OpNav Form 3750-1 and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Names used in accident stories are fictitious unless stated otherwise. Photo credit: Official Navy or as credited. Necessary articles may be reprinted with prior permission.

Contributions are welcome as are comments and criticisms. Address correspondence to Director, U. S. Naval Aviation Safety Center, NAS Norfolk 11, Va.

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GRR-R-R

Sir:

. . . In the course of trying to find out why so many accidents, I have run into the ADC concent: A JOB WELL DONE IS INHERENTLY SAFE.

It would be redundant to say more about maintenance than that a JOB WELL DONE IS INHERENTLY SAFE—not only for the maintenance personnel, but for the pilots.

Contrary to the belief of many of my friends, a squadron of tigers is a safe one. I've heard the definition of "tiger" which says that he is "all claws and no brains." In that case they wouldn't be safe. But my definition of a "tiger" is; a pilot who is a real pro; he flies his aircraft wisely and well; he has one idea for that flying; accomplish the mission.

For example: the fighter pilot who is on a mission to shoot down aircraft must have one idea: get on the enemy's tail and ride it until driven off or until the enemy is dead.

However, the tiger will not deliberately fly into a known hazardous condition unless the value to be gained from such a risk is more than equal to the hazard involved.

So a tiger must fly his aircraft correctly. If a man flies his aircraft correctly there is no pilot error accident. If the squadron does not fly instruments, it cannot accomplish its mission. Even the day fighter squadron must fly the weather often.

If the squadron does not engage in fights, using and practicing its tactics, it cannot accomplish its mission. In short, a pilot must practice what he will be called upon to do in combat, for talking about it *will not* teach the pilot to do it. If the pilot is taught correctly, if he learns correctly, and if he follows his teaching correctly, he will be able to do his job well, and it will be done safely.

Once more, this does not mean that the pilot is not exposed to hazardous conditions, but it means that he has learned, through being a professional aviator, to minimize the hazards involved. The pilot who accomplishes his mission whether he be in VF, VA, VP, or ZP, MUST BE A TIGER.

Does this not also mean that the aviator who takes pride in his ability to fly, who is proud of his squadron and of his own job in the squadron, who is proud of (or wants to be proud of) his own service reputation as an aviator, will see to it, by constant practice and study, that he knows the best way to fly in all conditions, and that he gets as much practice as possible in those conditions? Such a man must be a TIGER, and he is the kind of pilot I want by my side when the chips are down and the going is rough . . .

CDR, USN

Truer words are seldom spoken. Safety is a by-product of zealous efficiency in all phases of operations.—Ed.

Please turn page

EACH COPY OF APPROACH IS MEANT FOR 12 READERS PASS IT ALONG!

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Art and photos appearing in "Landing the A4D," with the exception of official Navy photos, col. 2, page 8 and lower col. 2, page 9, courtesy of Douglas Aircraft Co. Watercolors by R. G. Smith, Douglas aeronautical engineer.

continued

'. . . IF BY LAND'

Sir:

"Out of the Ordinary"—(March 1957 *Approach*) is a fine article, but you "pranced" over land situations. . . . Say a pilot lands in a wooded area and is injured. Because of the wind and the flight path his aircraft took after he left it, he is a good distance from the crash site. Rescue personnel only know he is within about 30 miles of the plane crash.

. . . In this article our pilot can use his emergency frequency radio and build fires. The radio is the "greatest," if rescue planes are within its range and it is working; the fires should make a good signal, if our pilot can find dry wood and is able to move about collecting it. If he has the "ifs" against him, what is he going to do?

Out of a 2-year period a squadron does about 40 percent of its flying from carriers over water; the other 60 percent of the flying is on the beach and mostly over land. We seem to have the water distress signaling and survival down; how about the other 60 percent?

Another consideration is that it is not easily determinable whether the pilot left his aircraft before it crashed. . . . where the pilot was not seen to leave his aircraft, rescue pilots are not alert for sighting the downed pilot while flying over the area in which there is a possibility that the pilot has landed.

BEACH BOUND

Good points! Generally speaking, the pilot making a nylon letdown on the beach has better chances of being rescued than one at sea—but we'll try to line up more info on the subject. In the meantime, distress signals useful in situations of this kind include:

Parachute (spread out—it makes an excellent marker)
Mirror reflections
Mk 13 Mod O Day and Night Distress flares
Pararaft paulin
PRC-17 (good only for line-of-sight transmissions)

BuAer is evaluating the use of chaff in parachutes for radar detection.

Readers' suggestions and comments on out-of-the ordinary land distress signals are welcomed.—Ed.

TAILPIPE COURTESY

Sir:

In regard to your article "JETSAM" in the March issue of *Approach*, I would like to report that VF-142 has not had a single case of engine damage due to foreign objects since receiving FJ-3 aircraft in April 1956. I believe these suggestions are worth passing on.

Thorough indoctrination of all pilots on taxiing. Particular emphasis being placed on the following:

(1) Look around. Don't blast the other guy. Don't let him blast you. Practice "tailpipe courtesy."

(2) Use the minimum power necessary for taxiing at all times. After commencing to roll, the normal idle RPM (42 to 48%) of the FJ-3 engine is usually sufficient. By planning ahead it is possible to coast into most spots where 80% might otherwise be required. The FJ will not pick up objects from the ground at low RPM unless they are previously disturbed by other forces.

(3) Indoctrinate other pilots to practice tailpipe courtesy.

(4) Taxi in sections, well separated to avoid the blast of the preceding section.

(5) Be alert to avoid all possible jet blasts and slipstreams from other aircraft and reduce throttle to idle and stop when such blasts cannot be avoided.

The maintenance and line personnel have done an outstanding job to insure that nothing was left adrift in the aircraft after maintenance was performed and that the line area is free of loose gear and debris.

It is of particular interest to note that a two-week deployment to NAS Cubi Point. P. I., which was still under the dust clouds of continuous construction, was recently completed without one case of foreign object damage. Credit however is also due to the vigorous sweeping campaign maintained by the Air Station during that period.

CDR E. R. HANKS
VF-142

BOUQUET

Sir:

Just a note to compliment you on a really excellent magazine—a h... of a lot of know-how is evident throughout. "Christmas Carol" [Dec.] and several other similar pieces are really superbly done for my money . . . Why not give the guys who write them at least a byline?

Would be interested in knowing reason behind this editorial policy —whatever it might be.

LCDR Ray ROBINSON
CHINFO (Mag & Book)

The author is LCdr Robert P. Brewer, 1310, USN, 157438, managing editor. As a result of your comment and many others, NASC policy on this matter is being changed. In the future you will see bylines on outstanding material. The previous policy provided bylines only for guest writers outside the Naval Aviation Safety Center on the theory that all Center personnel were obliged to contribute under the heading of assigned or additional duty.

Many of the humorous and other creative gems which you've read in Approach *(such as "And Then There Were None," "Walter Smitty," "Plight of the Valkyries," "Mirror Report," etc.) came from Bob Brewer's typewriter. His official title of managing editor fell far short of describing his outstanding role in building* Approach *from its very start, nurturing its preparation and formulating the magazine's positive approach to naval aviation safety. With this issue he writes "30" to his tour with NASC and joins the staff of ComCarDiv Six. It is an understatement that he will be missed here and by our readers. But* Approach *is fortunate in having another capable officer, Lt. William J. Thomas, recently of VAH-9, also a professional writer, to take up the reins.—Ed.*

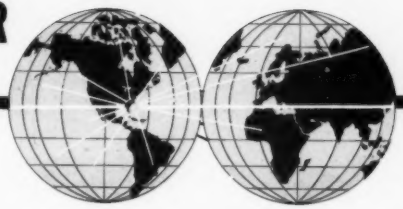
THANKS

Sir:

For the past two years I have been the Station Aviation Safety Officer of NAAS Kingsville and offer my sincere thanks and appreciation for the outstanding assistance received from the Naval Aviation Safety Center. I hope to continue working in aviation safety upon reporting to my new assignment.

MAJOR, USMC

MONITOR



EXCERPTS FROM REPORTS BY NAVY SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Landing Accidents—The cost of the landing accidents occurring at Cherry Point since December 1954 would be of a sufficient amount to pay the salary of a BrigGen to act as the Mobile Control Duty Officer for 17 years. It would be economically sound to have better qualified aviators as Mobile Control Duty Officers. It was requested that more attention be given to the briefings of Duty Officers for the Mobile Control Unit, accentuating the signficance of their duties by illustrating the results we have obtained while using the Mobile Control Unit. The reduction of landing accidents will continue only if the unit is efficiently manned. Landing accidents have been reduced approximately 75% at MCAS Cherry Point, since the Runway Mobile Control has been in operation. This fact alone should instill a more favorable mental attitude and reduce the tedium, inherent in the task.—*2nd MAW*

Back Course Approach To Cleveland—The installation of a compass locator has been approved for the back course of the Cleveland ILS. This project, active with ATA and ALPA for approximately 6 years has at last borne fruit. *ALPA—"Technical Talk for Pilots" 57-5 (Only six years—boy, let me tell you about . . . —Ed.)*

Targets for Your Prevention Efforts—It is of the utmost importance that training efforts be directed toward the prevention of in-flight accidents as well as landing accidents, since approximately one-half of the fatal first-tour pilot-caused accidents recorded in 1956 occurred during the in-flight phase. Of these in-flight fatal accidents, one-third were due to disorientation in weather, and the remainder evenly divided between mid-air collisions, spins from altitude in prop type aircraft, and miscellaneous causes.

Three main areas in which fatal accidents can be reduced are: (1) the over-extension of the pilot's capability during low altitude maneuvering, (2) disorientation in weather and (3) the inability of the pilot to adequately control his aircraft during landings and takeoffs.

As the speed and performance of combat aircraft increase, the precision control required simply to take off and land becomes greater, and the ability to fly these aircraft under instrument conditions becomes much more difficult to attain.—*CNO Aviation Safety Council.*

Use of Aldis Lamp—Many line personnel have complained that aircrewmen or pilots on multi-engine aircraft point the Aldis lamp at the line personnel needlessly. This blinds the lineman temporarily and could cause a taxi accident/incident. The Training Officer is directed to brief the VR and VP squadron pilots on more judicious use of Aldis lamps.—*NAS Columbus*

TEST PILOT TALK—No. 11

By Barry W. Wood, Jr.
Experimental Engineering Test Pilot
Douglas Aircraft Company, Inc.

A4D

It was a murky day at "NAS Boondock," and a low overcast hung sullenly over the countryside. Close to the end of the instrument runway was a cotton field, and in it worked two figures clothed in faded blue coveralls. One was the figure of an elderly man, and the other was obviously that of some younger kin. They were bent over, wearily chopping at the long rows of cotton, when a shrill whine made them both stand erect in time to see an object emerge

Georgia born Drury Wood, Jr. was commissioned in the MarCorps in 1944 after flight training in Pensacola. A *Corsair* carrier pilot in SoPac, Wood continued his carrier experience after WW II and in 1950 went to Korea with MAG One. He was later assigned to test pilot training at Pax. Wood joined Douglas Aircraft in 1955 at El Segundo, and has since been flying the AD, F4D, A3D and A4D.

Packing a potent punch which belies its dimunitive size, the A4D *Bantam Bomber* is rapidly gaining the approval of fleet pilots.

A4D

Continued

Navy test pilot Gordon Gray, present holder of the world's closed course speed record in an A4D, models integrated torso harness developed for newer family of Navy aircraft.

from the grey overcast in line with the runway.

The older man dropped his hoe and exclaimed, "Run for the house, Joe, and git my gun! One of them chicken hawks is a fixin' to pounce!"

The younger man looked up disgustedly, "Oh paw, 'tain't no chicken hawk; it's one of them new little airplanes over to the Navy base! He ain't goin' to pounce on nuthin' but a bar stool soon's he gits her down."

What Zeke and his son saw was the new A4D *Skyhawk*. With its long spindly landing gear extended, the little airplane does resemble a bird of prey. Not only does the long gear contribute to its bird-like appearance, but it also is responsible for the *Skyhawk's* ability to carry almost every piece of external ordnance in the book, and it's somewhat different landing characteristics.

Reasonable Approach Speed

From the break over the field to the approach end of the runway, the A4D is similar to every other sweptwing airplane and the same precautions and techniques apply. Now let's come up on NAS Boondock in a single A4D.

An approach at reasonable speed should be made to the airfield, and I personally do not like to use over 250 knots. This allows for a better opportunity to merge with other traffic, and no effort has to be made to drop to gear placard speed. In the A4D, this is 225 knots with no yaw.

Continued

Simplifid starter unit (above) shows thoughtful design of airframe and servicing components.

Designer Heineman, below, displays example of space and weight saving gained in A4D by repackaging bulky electronics gear items in foreground. Right: Lt. (jg) Helen Spiegel demonstrates lightness of the ejection seat.

LANDING THE A4D

Continued

The flaps may be lowered on the base leg and should not be actuated simultaneously with the gear as the extension time for both gear and flap will be unnecessarily prolonged. Airspeed turning base leg should be between 130 and 140 knots. If external fuel or ordnance is being carried, the entire traffic pattern speed should be increased by 5 knots per 1000 pounds of external weight.

At the 90-degree point, 120 to 130 knots should give a comfortable approach with full flaps. This speed may be allowed to decrease to 110 to 115 knots over the threshold where the power which has been carried throughout the approach may be cut and the airplane landed.

Speedbrakes *are not* recommended for the approach. The added drag does not contribute materially to placing the engine in a better acceleration range and does add some buffet to the longitudinal control.

After passing over the threshold, the familiarization pilot will find that the airplane will land very shortly after removing power. To further reduce the landing roll, the flaps may be immediately retracted and the speedbrakes opened.

The majority of current aircraft have alternate methods of reducing the landing roll by either getting all of the gear on the ground and using brakes, or holding the nose up and using aerodynamic braking. This latter method does not apply to the A4D. The nosewheel cannot be held off the deck for any appreciable length of time after the airplane's main gear has touched the ground.

Full aft stick will elevate the nose slightly, but will not give sufficient braking. Because of this reliance on brakes alone to stop the airplane, the familiarization pilot should use discretion with them. The airplane brakes well but will not tolerate pilots who "get-on-the-binders."

Take It Easy on Runway Turns

Until you are familiar with the airplane's ground handling characteristics, you should come to a complete halt before turning off the runway. If you try a scorching turn off, you may find that the nose has turned in the proper direction, but that the direction of rollout may remain the same!

It may be noted at this point that the proper time to open the canopy is after turning off the runway. The canopy structure will suffer damage if opened in excess of 60 knots, and this is not hard to do if one imagines a 20-knot wind down the runway and an airplane speed of 40 knots.

Speaking of wind down the runway, all of the foregoing is based on just such a premise. If there's a crosswind, consider the following: lowing:

If upon arriving at your point of intended landing, you find there is no runway into the wind, nor one with less than a 90-degree component of 15 knots, then land at another field where conditions are more favorable.

Crosswind Landing Technique

For crosswinds of 15 knots or less, the fol-

Stable silhouette is presented by A4D on carrier landing, above, while "stable" photo of hangar maintenance in the "barn," right, shows ease of access to essential items.

lowing technique may be used:

Immediately after lowering the nose gear to the runway, retract the flaps, open the speedbrakes, and use aileron to keep the upwind wing down and forward stick to keep the nose down. Use only the aileron deflection required, as sufficient rolling moment is available at high rollout speeds to lift the main gear from the runway. If either of the main gears is lifted, and the brakes are being used, it is most probable that a tire will be blown when it contacts the deck again.

The A4D will not swerve into the wind as most airplanes do, but rather downwind. For this reason I prefer to land on the upwind side of the runway. However, some Douglas test pilots prefer to angle across the runway as this gives a smaller crosswind component.

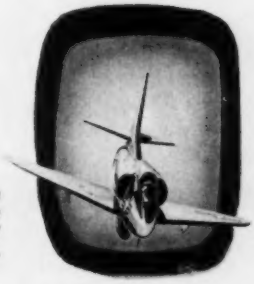
Takeoff Is Simple

It may seem backwards to talk about takeoff at this point, but there honestly isn't anything about the procedure that could get a pilot into trouble. The airplane's high thrust-to-weight gives it a short takeoff run in most configurations and there is no problem of over-rotation. Nosewheel lift-off and takeoff are practically one and the same. For this reason, the only comment I can make about the takeoff is to say, "take off."

I am sure that all of you who will fly the *Skyhawk* will grow as fond of it as I have, and that the observation of the simple techniques required to land it will increase your mastery of the simple, honest airplane that it is.

Relatively high, narrow landing gear design of *Skyhawk* gets approving nod from maintenance personnel, above, at minimum sacrifice of taxi maneuverability, below.

Extensive underwater tank tests of F4D canopy provided valuable data on jettisoning similar canopy on A4D.



For further comments on A4D operation, please see HEADMOUSE SPECIAL, page 14—Ed.

The purpose of Anymouse Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hairy or unsafe flight experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action. Please send your reports to the Naval Aviation Safety Center, NAS, Norfolk 11, Va., now!

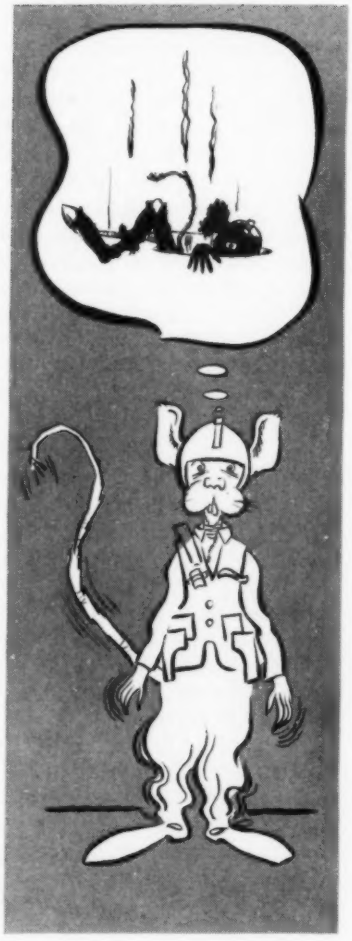
INADVERTENT

"On returning from a bombing hop on a target, which was found to be closed for that particular day, our flight leader requested a straight-in approach because we were loaded with ten 100-pound water bombs on each of our AD-6 aircraft.

"I was number 3 in the flight and took about a 20-second interval on the second plane. The interval between aircraft grew smaller and I dropped gear and flaps and reduced power a bit. As I rapidly closed the other aircraft, I popped my barndoors and finally slowed down and got a good interval with about a mile straightaway and 800 feet.

"I reached down and pulled up the divebrake handle (I thought . . . .). Noticing a sinking sensation, I added several inches of throttle and felt better. A few seconds later I was over the end of the runway and chopped throttle to land as I had been slightly fast. I immediately landed in a definite three-point attitude and stuck to the deck like glue (I figured the 10 practice bombs made me land so hard).

"As I was rolling out I reached down to pull up the flap handle. Much to my surprise, it was already up! . . . Hmmm . . . .



"Back on the line I saw a rather unusual thing out of the corner of my eye . . . my side divebrakes were extended. Feeling slightly stupid, I pulled the correct handle UP.

"Later the seriousness of the situation hit me squarely between the eyes. I could have been sitting in a 10-foot hole just short of the runway."

CLOSE

"I was preparing a flight for a flyover on a Fourth of July, and to bring the aircraft availability up to the number of aircraft, I had to fly three test hops. I had a good breakfast and being busy throughout the day with small problems had two cookies for lunch.

"At the end of the third flight, I entered the break, checked airspeed and found it was just low enough to lower the landing gear.

"I throttled back a little more and while on downwind leg put the flaps down. I looked at the wheel indicators and called, 'turning base, gear down indicating locked.'

"Between the 180- and 90-degree spots I was fast but thought it was okay because it was fast at the 180. At the 90, a very alert (thank goodness) tower operator asked if my gear was down. As I turned my eyes to the wheel indicators, I was thinking to myself, 'hell yes, they're down.' But, as my eyes focused on the indicators, they were UP UP UP!

"Believe me, it jolted me to say the least. I waved off, re-entered and landed.

"My recommendation to myself and others: Don't hurry while flying, especially from the time you enter the landing pattern until you are in the chocks. Don't carry your problems aloft. Keep your mind clear and think of what you are doing."

NO STOOP, NO SQUAT, NO CHECK

While conducting a survey of aircraft line safety precautions, a NARTU aviation safety officer shook the rudder of an SNJ he was behind and noted a slushing sound. He shook it again. His suspicion was confirmed; there was water in the rudder.

The ASO recollected there was supposed to be a drain hole at the bottom edge of the rudder. He stooped down and found two drain grommets but they were not punched. He dug a hole in the grommets with a key and out came a couple of steady streams of water.

In all, about three to four gallons of water drained from the rudder. Three gallons of water at 8 pounds to the gallon is 24 pounds. On the end of an 18-foot lever (distance from normal C.G.), 24 pounds is 432 foot-pounds.

Some of the pilots had noticed that they required less nose-up trim on takeoff and landing this particular SNJ, but none ever squawked it. The ASO climbed up on the wing and checked the trim setting. It had not been changed since the last landing an hour before and was set at the one o'clock position instead of the normal eight to nine o'clock spot. The last pilot had to use nose-down trim to make a tail-first landing.

The safety officer wondered how many more rainstorms would it have taken to move the C.G. far enough aft to cause an uncontrollable stall. The fabric was replaced by O&R two years earlier. Numerous checks had been pulled since the rudder was installed.

EN HAND

"While cruising in an SNB-5 on a daylight VFR flight I attempted to open the cowl flaps to climb. The port cowl flap control handle was pulled free of the linkage. Inspection showed that the locking screw had worked loose just enough to allow the actuating handle assem-

Anymouse continued next page

anymouse
and his hairy tales

Continued

bly to become disengaged from the control cable.

"While not hazardous under daylight VFR conditions, the same incident occurring at night under instrument conditions or with an inexperienced pilot, could be potentially hazardous.

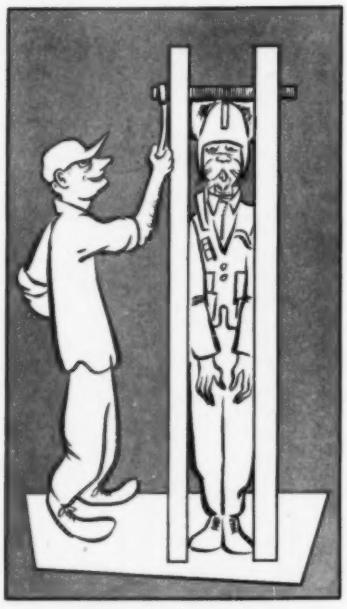
"By examining the handle and linkage assembly and by experimenting it was discovered that by releasing the engaging catch by hand the cowl flaps could easily be actuated by pulling or pushing the butt end of the cable. (Care is required, however, for intermediate cowl flap settings since positive position locking is not available. The position locking slots are in the handle tube which came off.)

"The same procedure could easily be accomplished with the aid of a flashlight at night or in darkness provided that the pilot is familiar with the procedure. He can thereby retain cowl flap control without the actuating handle."

HELPING HAND

"I received clearance to fly an OE-1 on an RON at a field which provided security but no service facilities. After landing at the RON airport I secured my aircraft by placing the control lock and parking brakes ON, chocked the gear, and tied the aircraft down for the night. I noted that there was one other aircraft from my squadron already secured at this same field in a like manner.

"Later that evening a third aircraft from our squadron arrived and the pilot secured his plane and inspected the other two aircraft.



He noted that none of the aircraft had the rudder battens on so he inserted rudder battens in the two aircraft.

"The next morning, after getting up early (the other pilots weren't up yet) I went to the field, preflighted, and turned up. I taxied to the takeoff spot using only brakes (rudder control is normally used to taxi this type aircraft).

"The takeoff was uneventful as it was a 3-knot wind and the flight to the home field was routine, requiring only small changes in heading. I descended to 500 feet and entered downwind. As I turned off the 180 in my approach, the nose fell through and although I practically stood on the rudder, the ball was clear out at the bottom of the turn. Aileron and elevators were used to level the wings and stop the high rate of descent.

"I investigated and found I had only one to one and a half inch rudder throw. A long straight-in was used and an uneventful landing made. Braking action was able to hold the plane on the runway in spite of a 12-knot 45-degree crosswind from the left. I taxied in and very painfully saw the look in my plane captain's eyes when he saw the rudder batten on the rudder.

"It was completely my fault in that I performed a rather complacent and sloppy preflight inspection."

ANYMOUSE

"Is my face red!

"It took this incident, reported to me by this pilot, before I realized that our control battens are a dull, drab natural wood color and have never been painted a bright color to aid visual checks. Corrective action has been taken."

Embarrassed Safety Officer

SAVE A JET—VR-23, among others, suggests putting trash cans around jet operating areas marked: SAVE A JET CAN. Nothing more has to be said, the lesson is obvious and will appeal to everyone who might be tempted to drop some small bit of rubbish on warm-up aprons or other areas where jets operate. Try it.

—AirPac June 1957

Headmouse

PULL 'EM ALONG SIDE

Dear Headmouse:

To the Safety Council suggestion of parking servicing vehicles parallel to the aircraft parking line or parallel to the longitudinal axis of airplanes in an effort to prevent vehicle-aircraft collisions, let me add mine:

In future designs of NC-5s and refuelers/oilers in particular, mount cable or hose stowage reels so that hose or cable can be reeled off or on from either side. Present designs suggest to the driver and hose/cable handler backing in towards the "target" instead of pulling along side.

Blind areas behind vehicles are directly responsible for nearly all cases of fueler/aircraft collisions. In the cases of NC-5/ aircraft collisions, the driver's foot either slips off the clutch or brake, or "jumps" into gear. In any case, the NC-5 lurches *backward* into the airplane it's servicing.

Anymouse

All newer model fueler and NC-5 vehicles have hose and electrical cable mounted parallel to the longitudinal axis of the vehicle. In the meantime, pull 'em along side.

Very resp'y,
Headmouse

TRACKER TROUBLES

Dear Headmouse:

For taxiing S2F aircraft in unlighted areas and taxiways, an ALDIS Lamp is provided. However, it is a 115- volt unit lamp operating directly from a generator that doesn't cut in below 1300 rpm—too high for taxi. This light should be replaced with a 28-volt unit and a 28-volt power connection.

An alternate inverter should be installed that is capable of handling the ADF at least. An inverter failure now disables the radar, radar altimeter, radio compass on ADF and loop, the radar altimeter, and UHF DF. A fuse or main inverter failure could cause dangerous disorientation.

Light icing shuts off audio signals as effectively as a switch on the low frequency receiver and the LF direction finder.

ANYMOUSE

First item:—The Aldis lamp is a 28-volt dc fixture, runs through the monitor bus and requires that one generator be operating or an external power source be applied.

Second item:—While the items listed are dependent upon the main inverter, at least in part, as a power source, the failure rate of the various inverters for the period 1 January 1955 to 1 October 1956 has been very low. During this 21-month period the following number of inverter changes were made:

Main inverter
119 (4.9 per 10,000 hours)
Standby inverter
72 (2.96 per 10,000 hours)
Pilots inverter
137 (5.65 per 10,000 hours)

From the records available it is not possible to determine the actual number of inverter failures; however, it is felt that the reliability of these components has been excellent. The "dangerous disorientation" resulting from inverter failure could be lessened by reliance on either the APX-6 or ARC-5 systems as neither of these installations are dependent on the inverter systems for operation.

In view of the facts presented, installation of another alternate inverter for the proposed purpose of energizing the ADF does not seem warranted.

Very resp'y
Headmouse

JETANKERS?

Dear Headmouse:

On the night of 28 November I was called out to service an S2F that had just returned from a cross-country flight. I took a fuel truck out to the line, made sure the fire watch was posted, and commenced pumping fuel.

As soon as the fuel started to flow I realized something was wrong. I cut off the fuel flow and checked the truck. I had pumped about 25 gallons of JP-4 into the plane tank. I notified the duty officer and he ordered the plane defueled.

The next morning I contacted the Aviation Safety Officer. He is having signs made to read "JETS ONLY." These signs will be secured to the dash board in all our JP trucks.

The Aviation Safety Officer noted: "The signs above are only a temporary fix. This is another case where 'Murphy's Law' applies, and until the fuel tank filler necks and fuel hose fuel nozzles on refueler trucks are modified so that it is impossible to put jet fuel into *propeller aircraft* tanks, this potentially serious condition will continue to exist."

CONCERNED

HOW TRUE

Dear Headmouse:

Re: Your Anymouse on fuel nozzles; and filler necks in December 1956 issue.

All that you say is true *but* errors continue to occur or are caught at the last second by an alert bystander or the like.

It appears that our friends in BuAer are not acquainted with our friend Hogan who, like his bloodbrother Murphy, has a penchant for doing things engineers, etc., would hardly think possible. As with Murphy, if there is any possible way of wrongly using ground servicing equipment, he will find that way and so use it, training and indoctrination and supervision notwithstanding.

ANYMOUSE

We're sympathetic—Anyone else got any comments?

Very resp'y,
Headmouse

Headmouse Special:

Headmouse is pleased this month to have as a guest a particularly well-informed squadron skipper with some recent A4D operating dope. Said info ties in quite neatly with Drury Wood's test pilot talk elsewhere in this issue.

To the many aviator folk who know Cdr. Bob Hunt, he represents an enviable combination of theory backed by practical experience. His comment on the operation of the A4D is in the form of a letter to the skipper of another A4D squadron. If you should like Bob's way of putting out dope as well as we do, let us know same and we'll hit him up for a second helping.

DEAR PETE:

GOOD to hear from you again and we are always pleased when our friends turn in what they have for a new allowance of A4Ds.

You ask for some hints and wrinkles, and of course send up your maintenance, aviators equipment, and weapons people for discussion with our Department Heads on these subjects. I will limit myself to some fairly general stuff on the approach we have used with the airplane. Not that this is "Holy Writ," but we feel that this is one way to do it.

A word of caution: We consider the airplane much like the old F8F. Like the F8F, if you approach it with a great deal of respect and knowledge it will do some fabulous things for you. However, if you get careless and begin to figure "you have got this program knocked," and relax your approach, I am sure it will begin to kill people. So let us all handle this bird with the precision it deserves and it will have a fine record.

Landing airspeed. We figure it this way. Call the basic airplane, ready to fly, but without fuel, 9000 pounds. With full internal fuel the airplane weighs considerably more and at this weight the MINIMUM flight airspeed is 120 knots. This is the landing we are going to make if things turn to worms right after takeoff and we jettison external stores and swing right around into the landing pattern. Then, when you hit 12,000 lbs. (3000 lbs. internal fuel), you have a new minimum approach airspeed of 110 knots. This gives you very good landings with 74 to 78% rpm at touchdown.

Don't let your pilots come over the end and pull off the throttle for a landing. Since you are going aboard with a mirror and canted deck system we might as well start out right now to reduce the variables. Make 'em all the same.

Teach everyone to use the bugs on the airspeed indicator. Before takeoff we set airspeed at 120 for the above reasons, and mach at .82 since this is your climb schedule from 35,000 and up. I'll confess that when I hit the 12,000-lb. figure in flight I reset the bug for my 110-knot approach speed. (On this basis, CV mirror approaches are flown at 118 to 132 knots as you come downhill from the 110-120 at start of glide path.) She will keep on flying quite a bit below this number, but if you try it she will also seduce you into the backside of the thrust-required curve and settle into the dirt short of the runway!

Around the field we define "reasonable speed" as between 250 and 300. This involves the use of speedbrakes and 80% rpm for letdown with a formation to enter the break. We don't like to fly into the pattern with brakes OUT because we do have an established routine after the break, so we clean up about five miles out and come in at 80-85% This gives us about 280 at break.

We use the bugs on the airspeed-mach indicator all of the time and feel that precise control of airspeed is one of the keys to success with the plane. Set 120 knots at the time you strap-in and this is the minimum flight speed for an immediate landing with full internal fuel. (Will elaborate on this point in just a moment.) We certainly agree that speedbrakes are not needed nor desired for approaches.

Brakes, wheel type, appear to be no particular problem to us once you get used to the idea that these are *not* power brakes. We haven't any hotrods skidding the wheels from attempting to turn too fast. Motto follows: Handle it smartly in the air, and slowly on the deck. *All that's said about crosswind landings is true.*

This could be particularly important because the crosswind landing problem is going to loom up, big and ugly, very early in the game. How to handle that one? Well, when the wind reaches 12 knots of effective crosswind (see the kneepad card) the pilot has the choice of another runway.

When it reaches 15 knots he no longer has the choice and must land on a runway nearer the wind. Now what about that other runway? We frequently use the 4000' ones at our base and have no troubles now that everyone has mastered the crosswind landing techniques.

It is certainly worth your while to demonstrate some of the short field performance to convince yourself and the rest of the pilots. It will make the stops as advertised in the handbook. A normal stop can be made into 15 knots of wind in 2700 feet. A stop can be made into zero wind, by stop-cocking the engine on touchdown, in 2200 feet.

Skipper Bob Hunt, an old hand at transition problems, checks out a new pilot in the A4D.

Once everyone has a feel for these numbers they will rest easier when faced with that short one.

It goes without saying that the foregoing figures are based upon the airspeeds discussed earlier and with about 1500 lbs fuel remaining. There are only two degrees of crosswind: (1) barely perceptible and (2) "GQ." For anything above five knots effective, give it all you have. Trim rudder so as to slip into the wind, make the final approach with one wing down, in a controlled slip, headed down the runway. When you touch down, open the speedbrakes, raise your flaps, get the stick forward and get it into the wind, even use the trim to reduce aileron forces during the rollout. Stay ahead of it and you are alright, but if you fall behind you are never going to catch up.

Some of your new boys are going to fret about "G-overshoot" with this delta wing. Here is another safety factor. The stick force per G is quite high and it takes a good husky pull to get near the region. It does occur, but is very mild and only shows up at 5½ G and above. There is little need to get up in here and in any case this is about the limit for some of your lighter pilots. "Idiot loops" (over-the-shoulder type bombing) come smooth as silk, with no buffet or stall effect at all. We run minimum airspeeds "over the top" around 240-300 knots depending upon load and ambient temperature. It is as safe as being in a brick church.

Takeoff performance is nearly spectacular. At Leeward Pt., Gitmo, carrying only eight practice bombs, we were getting off in 3000 feet. You will have a little trouble overrunning the gear limit speed at first, but when your people get the timing down for gear retraction this will be no problem. The acceleration is so fast that you can lift the flaps at the same time you actuate the landing gear and she will pick up speed so fast that there will be no settling.

J-65 Precautions: *On the J-65 no precaution is too great.*

Always use pre-oilers to add 7808. Check everything all of the time and let your engine crew and line crew know how completely you are dependent upon them. Keep the oil clean, keep the ramp cleaned up and check the rundown time on every shutdown. We had a rash of foreign object damage, partly due to incomplete safety precautions on our part.

Get everyone walking the ramp. When I walk back from a flight I search the area and hand anything I can find to the Line Chief. I think that it frosts him sometimes but it does help get it cleaned up.

Hydraulics: We have had very few hydraulics failures. When you do, disconnect the boost (below 350 or .84 M) extend the stick and make a normal entry. Lower the gear normally; the wind blows it down since it retracts forward, operate your flaps and be sure to lock the flap control after you get them down. If they won't go down you are *really* out of fluid and you increase the 110- 120-knot speeds by a flat 10 knots. No more, no less. This is important, because everyone has a tendency to get a little gravy; if they get too much they slip in it. The speeds are correct; there should be no need to slip them in either direction. We even schedule a little emergency fam flight.

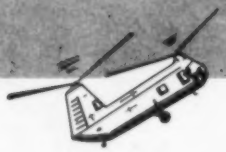
Oxygen system: With this LOX system none of your pilots will spin out of formation at 35,000' and go in without making any attempt at recovery. We like this feature. You always breathe 100% oxygen under pressure. The only thing that can happen is to run out, in which case you turn purple and pull the bailout bottle. Never a question as to whether it is working. Incidentally, we consider the airplane down without LOX. There's the cockpit contamination problem in the event of a failure of No. 1 bearing oil seal, and we just won't accept the risk.

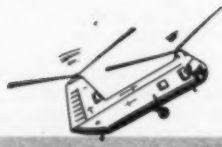
We have worked with the helicopter people everywhere we go and find that the life jacket (Mk C3, serial 100 or above) parachute and integrated harness are compatible with the sling. You know what you need to operate in this field; dig in your heels and insist on getting it. Accept no substitutes.

Give the A4 and your pilots and maintenance crews personal treatment and know this airplane inside and out. You can't help but like this airplane, and if you don't, you just don't have any red corpuscles left.

Be careful and let's all grow gray and bore the space jockeys with our tales of "before they took the wings off."

Sincerely,
BOB





practice autorotation

Do actual emergency forced landings occur with sufficient frequency in helicopter operations to warrant continued autorotation practice for these emergencies?

AN ANALYSIS of the forced landings (no damage or injury in helicopters during fiscal 1956 as compared with the practice autorotation "accidents")

HELICOPTER accidents which occur while practicing autorotations have been labeled as a "continuous recurrence" of sizable proportions by a Naval Aviation Safety Center analysis. In order to define the problem of autorotations more clearly, specific questions were raised. The answers were gathered from aircraft accident reports and endorsements; forced landing, incident, and ground accident reports (FLIGAs); and from personal contact with operating units.

indicates that the answer should be: "Yes. Autorotations must be practiced."

What is the ratio between successful emergency forced landings and practice autorotations that have resulted in damage to helicopters? i.e., do "saves" justify the losses incurred in practice?

THE RATIO of "saves" (58) to "practice accidents" (17), during the given period is better than 3 to 1.

If continued and extensive autorotation practice is deemed necessary, couldn't the value of this training be maintained with but a small loss of realism by increasing the minimum leveling off altitude, thus providing a greater margin for error?

THE RESTRICTIONS to practice autorotations restate the added requirement by some commands to level the helicopters with power by at least 10 feet above the ground. This altitude is sufficient if the tail (lowest part during a flare) is kept at or above that minimum.

If autorotations must be practiced, how many and how often should they be done in order to maintain adequate proficiency in this maneuver?

THERE is insufficient information available to the Safety Center to answer this question. An article in the *Army Aviation Digest* suggests that "four touchdown autorotations per month should be enough for the average aviator to maintain his proficiency." One civilian helicopter training course contains an autorotation phase of about two hours in a 75-hour course.

A Marine Corps air commander notes that "even before the advent of jet aircraft in regular tactical squadrons, the practice of shooting small fields for emergency purposes gradually declined throughout the operational commands as airplanes became more reliable. Perhaps too much stress at the cost of damaged equipment is now being laid upon emergency landing procedures for helicopters."

What restrictions, regulations or changes in technique should be added to the existing ones in order to increase the safety in performing this practice emergency?

ACCIDENT boards and chain of command endorsers have recommended that helicopter pilots either reduce the number of practice autorotations or prac-

Continued

QUESTIONS and ANSWERS on

practice autorotation

A good rule which may well be followed in practicing autorotations, is "to never close the throttle all the way to idling position." Collective pitch may be reduced as rapidly as desired, but engine RPM should be maintained at higher than idling speed. During autorotation the engine and tachometer needles need be split by only approximately 200 engine rpm to assure the pilot that no power is being applied to the rotor. This technique greatly reduces the possibility of engine stoppage. Other tips, based on actual accident experience, are listed below.

tice *more* autorotations. In no case was there a recommendation to cease the maneuver.

Various units have added these additional precautions however:

NO SOLO touchdown autorotation; level-off with power before reaching the ground (10 feet high was mentioned).

PRACTICE ONLY over terrain where a completely unobstructed landing can be made in the event the engine fails during the practice; a hard, level surface is preferred.

BEGIN THE PRACTICE HIGH; 500 feet minimum where a 90-degree turn is involved, higher if a 180-degree turn is to be made (model and gross weight/density altitude must also be considered).

ALWAYS HEAD INTO THE WIND. Practice only where a good wind indication is available.

HIGH GROSS WEIGHTS, density altitudes and certain conditions of landing constitute an unjustifiable hazard and should be closely monitored by pilots and flight supervisory personnel. Autorotations should not be practiced when these conditions exist.

ONLY CURRENTLY QUALIFIED, recently experienced pilots should attempt an autorotation without a thorough briefing, demonstration and close monitoring by an instructor who is well qualified in model and modification.

PILOTS NOT DESIGNATED FIRST PILOTS in the helicopter model being flown will practice autorotations only when accompanied by a designated instructor pilot (dual configurations only).

TO MAKE A "SPOT" AUTOROTATION, one recommended procedure is to come to a hover, recover with power and then take a waveoff. Do not attempt to land on that pass.

TO MAKE A TOUCHDOWN AUTOROTATION, when no power is to be used during the recovery, land with some forward speed, the amount of speed being dependent on the model helicopter and type of landing gear—with wheel-equipped models, insure that the pilot in control has brakes.

BE ALERT FOR POWER SETTLING conditions when practicing autorotations and know the proper recovery technique for the model being flown.

AVOID OVERCONTROLLING with back cyclic to stop forward speed when making a landing in a near zero wind condition.

RE-EMPHASIZE "TAIL-LOW" as a term applied to near the ground operations instead of "nose-high" as the former term more nearly describes that part of the helicopter most often damaged during practice autorotations.

PASSENGERS should not be carried when practicing autorotations without the express permission of flight supervisory personnel.

Confidential accident rates and figures from the initial study were forwarded to units concerned by Confidential NASC Letter Ser 025 of 10 May 1957. —Ed.

Truth and Consequences

The F8U touched down short and lost one main gear when settling occurred on final.

UNEXPECTED SETTLING—As the F8U turned base the tower reported a starboard crosswind of 25 to 35 knots. The pilot had 1000 pounds of fuel remaining and requested a touch-and-go landing on the 6000-foot runway.

Airspeed on final was about 140 knots. The pilot felt he had more than enough power—83 percent. "I came over the trees located about 1000 feet from touchdown and about 200 feet from touchdown eased power as I was fast and started to flare. Within 100 feet from the end of runway, I experienced a gusty downdraft and tried to compensate for it with a slight stick rotation and power addition but touched down about 10 feet short of the runway . . ."

The port gear sheared on the lip of the taxiway which abutted the end of the runway and acted as a short overrun. The pilot corrected a slight swerve to the left and thought he had blown a tire. However, the tower called with the information that he had lost a wheel.

After a 2000-foot run the air-

Continued

Truth and Consequences

Continued

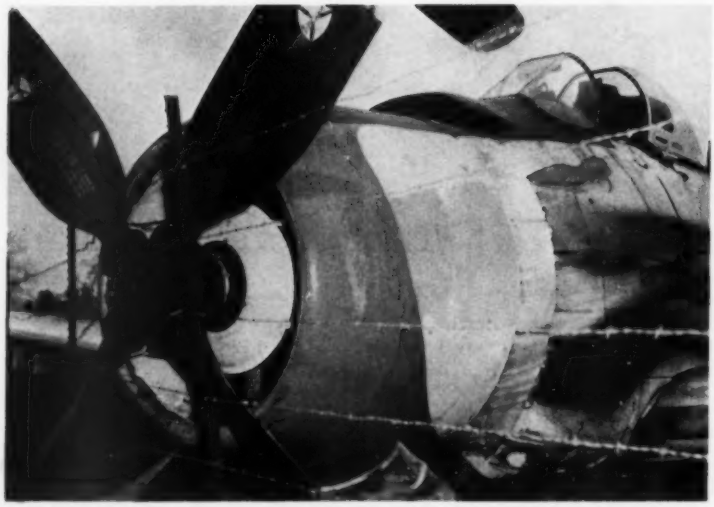
craft began a gentle swerve off the runway, coming to rest with the port wingtip on the ground.

Another F8U pilot landed shortly after the accident and also reported a tendency to settle after clearing the trees in the approach zone. He had set up the same power but instead of easing power had kept it on, making a flat long final. In order to check the settling, power was advanced to about 90 percent and he said, "this was still slightly insufficient to check the rate of sink. I picked up the nose somewhat more than I felt desirable; landing fairly hard on the extreme end of the runway."

Because of either air riding up over the trees or gusty wind conditions, unexpected settling did occur on the short final and definitely contributed to the accident. The board concluded that easing power without sufficient consideration for the wind conditions was the primary factor in the accident.

FENCED IN—When signing for his AD-4B the pilot was informed that he would have 2000 pounds of internal fuel available but a pylon tank with 150 gallons had an inoperative fuel transfer system. The pilot was on his second flight in the AD and after recording fuel consumption in flight, figured there was internal fuel for four hours.

After three hours he noticed his fuel gage reading only 200 pounds and a return to the field was begun. It was a "hasty" return as he proceeded at fast cruise power settings.



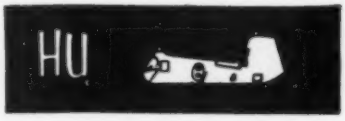
Looking forlorn and ragged, this fenced-in AD was put out to pasture when it ran out of gas on a VFR day—something a well-bred aircraft should never, no never, have happen to it.

Five miles from the traffic pattern the fuel reading was down to 100 pounds when suddenly the engine sputtered, quit, and the warning light came ON. The useless external tank was jettisoned immediately.

A wheels-up landing was made in an open field with no injury to the pilot or private property. It was determined by inspection that there was no internal fuel left.

The board felt the primary cause of the accident was the failure to allow sufficient safety factor in estimating his remaining fuel supply, and his failure to recognize his low fuel state until his situation was critical. Also, this accident might have been prevented if the pilot had immediately reduced power for a slow cruise condition when he recognized his low fuel state.

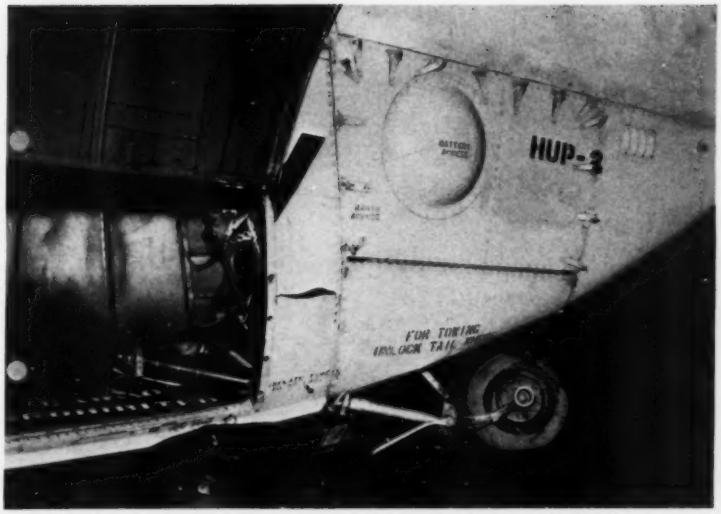
An endorsement on the report noted that all pilots should be cautioned that the fuel gage on the AD is not a precise instrument and is not considered reliable within 100 pounds of fuel.



FORCEFUL DEMONSTRATION—A month had elapsed since the pilot's previous flight in a HUP and during the first hour of flight he and his copilot practiced autorotations, normal landings, and low altitude maneuvers. Then the pilot attempted to demonstrate to the copilot the effect on rotor RPM of an engine failure.

The throttle was closed first to split the engine and rotor tachometer needles prior to dropping collective pitch to low pitch position. This maneuver was begun at 500 feet and 60 knots. Immediately after collective pitch was reduced the rotor tach needle read 200 rpm and airspeed 40 knots.

The pilot nosed over to regain airspeed and rotor RPM and, as the ground came up, he married rotor and engine needles at 2000



When the tail wheel was damaged in an autorotation landing, a lineman prevented greater damage with cushions for a soft touchdown.

rpm (232 rotor rpm), applied power and attempted a flare. This action did not prevent the aircraft from striking the ground in a hard tail-low attitude. It became airborne under control with the tailwheel strut collapsed. Further damage was prevented when the HUP tail was landed on seat cushions provided by the lineman.

According to the board, the maneuver was not specifically prohibited by any directive but was not the method recommended in the Pilot's Handbook for simulating an engine failure. It was used in the squadron by experienced pilots in simulating and demonstrating what these pilots considered to be more realistic conditions of engine failure. However, several errors of pilot technique were brought out in the investigation of this particular accident.

The handbook warns that the low limit of rotor speed (230 rpm) is permissible during transition to autorotation, and that rotor speed should be increased to the desired range as rapidly as possible. At the entry of the autorotation the rotor RPM was 200 and it did not approach the minimum RPM until just before touchdown.

The analysis notes that the condition of high rate of descent, which occurred immediately following dropping collective pitch stick, was further aggravated by the pilot's action of immediately nosing over. This is contrary to the procedures for recovering RPM outlined in the handbook, which states, "for power failure between 30 and 60 knots, hold the cyclic stick steady until autorotative descent is established, then position it as required to obtain the proper airspeed." Nosing the aircraft over sharply increased the rate of descent rapidly, as airspeed increases but delays the recovery of rotor RPM.

The board concluded that pilot error was the primary cause (improper technique employed) and that secondary cause was considered to be reduced pilot proficiency. One month had elapsed between this flight and the pilot's previous flight in this model helicopter.

It was recommended that simulated engine failure autorotations, performed by retarding throttle before reducing collective pitch, not be performed in operational squadrons as it was felt the training value derived is far overshadowed by the . . . risk of establishing a condition of reduced controllability of the helicopter.

For more on autorotation problems, please see page 16.—Ed.

Hole-In-One

A UF-1, taxiing up to the stern of a small copra ship, attempted to stop by reversing props (no sea anchors out). One prop reversed, the other didn't, the uncooperative prop struck the stern of the ship, causing overhaul damage to the engine and strike damage to the prop.

The ship? Well, there was a wooden privy lashed to the stern quarter (leeward side, of course), which just goes to show the unerring instinct of the albatross has been carried over to its man-made counterpart! Owner of the ship signed a very legal-and-proper looking liability release, but added a penned postscript:

"Dear Navy, In lieu of the considerations mentioned above, how about letting us drydock the ---------- . . . if the drydock is ever available? If so, you can bump into my ships whenever you want. If unable, that's okay too."

It was almost CAVU, and tailwinds were forecast—

WHAT COULD BE EASIER?

COMPLETING a flight in an SNB the 3000-hour pilot noted on the yellow sheet that "the left main fuel gage indicated two tenths fuel remaining and the engines stopped. Refueled with 77.3 gallons (for info of pilots)." According to the handbook the tank in question contains 77.7 usable gallons so for practical purposes it was empty. The erroneous reading of two tenths remaining would amount to about 15 gallons.

In six local flights after that entry, there were no other squawks on the gage. Records did not indicate the discrepancy was worked off nor was the gage placarded.

Five days after the gage was squawked, the pilot reporting the discrepancy drew the same *Beechcraft* for a cross-country hop. The assigned copilot had 500 hours in the *Beech* but had not flown one for three years, most of his recent time being in R4Ds. He was to requalify in the *Beech* on this trip.

Both pilots planned the first leg and as weather was forecast to be good en route with tailwinds, the first fuel stop would be 800 nautical miles away. A VFR flight plan of 4 plus 55 with cruise altitude of 4000 feet was submitted. Fuel aboard, including nose tanks, was computed as 6 plus 30.

Takeoff was made in the early afternoon with the copilot driving from the left seat. The pilot was busy with navigation, position reports and the flight log. Initial cruise power was 27½ inches mp at 1950 rpm and apparently that setting was used throughout the flight.

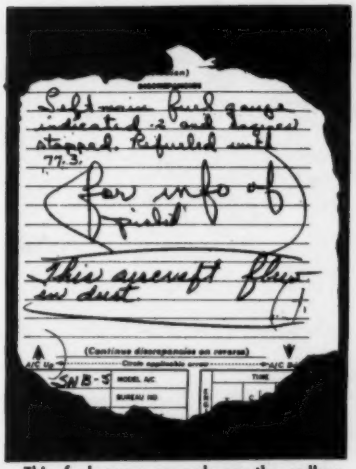
Soon after takeoff it became evident that the predicted winds did not hold good. The log indicates the flight was 6 minutes behind the ETE at 200 miles. Some 325 miles from takeoff the flight was 15 minutes late and 180 miles further on was 20 minutes late. By now it was dark but the good weather had held with high scattered and 15 miles visibility.

During the process of balancing the fuel load, No. 1 tank had previously been burned down to a reading of 6/10. Now, upon passing Columbus, Ohio after 4 plus 50 en route, the remaining fuel was contained in No. 1 and the fuel selector was shifted to that tank. Only 128 miles remained to the destination radio fix and the copilot recalls that the fuel remaining was estimated at an hour and 10 minutes. With a 6/10 reading on the gage there should have been 46 gallons aboard. Possibly, because he had overlooked or forgotten the error in the No. 1 gage reading, the pilot made no mention of it to the copilot. There was not 46 gallons in the tank.

Obviously the flight was well behind the estimated time for the trip and it may have occurred to the pilot that his estimate of 6 plus 30 fuel aboard was overgenerous. The way things were going a better estimate might have been 6 hours. Nevertheless there was little doubt in the cockpit that sufficient fuel would remain to land safely.

Droning on eastward, the flight passed over Wheeling omni and angled toward the Pittsburgh range. Station passage at Wheeling was 28 minutes later than the original preflight estimate. There remained only about 25 miles to the fix. According to the log it was an 8-minute trip and that was tacked onto the time over Wheeling for a PIT estimate. However, it was 14 minutes before the *Beech* passed over Allegheny County airport (a lighted air port very close to PIT range).

Realizing Allegheny County was not the airport of intended landing, a steer to Greater Pittsburgh airport was requested. About this time the copilot observed the fuel gage showing from 2 to 3 tenths fuel remaining and according to the copilot the pilot did not seem concerned about fuel.



This fuel gage squawk on the yellow sheet was the difference between a successful landing and a crash when adverse ground speeds and fuel consumption slimmed the pilot's reserve.

After a steer from Greater Pittsburgh the aircraft began a turn. While in this turn both engines quit. Both airports heard the transmission; "Mayday—we're out of gas!" The time in flight was then 5 plus 39.

The pilot immediately took the controls and set up a glide. He flipped on the landing lights which illuminated a heavily wooded area. The aircraft stopped among the trees in an upright position with the nose and cockpit area demolished. There was no fire or explosion. The copilot had his shoulder harness on and he received serious injuries.

The pilot's shoulder harness was not in use and the accident board felt he might possibly have survived had the harness been on and tight. His seat would have remained intact and upright and he would not have been thrown forward into the yoke, throttle quadrant and instrument panel, where the most serious injuries were incurred.

Continued next page

WHAT COULD BE EASIER?

Continued

The board observed that use of the forecast winds during the flight was not unreasonable. With 4 plus 55 en route under practically CAVU conditions at 150 knots TAS, there was a sufficient safety margin of fuel, but not as much as indicated on the DD-175.

However, the success of the hop rested on the winds aloft remaining favorable. Once the actual groundspeed fell behind the predicted speed due to inaccurate wind aloft reports, the fuel reserve shrank until at last there was no reserve at all.

Except for one 78-mile stretch, the actual groundspeeds, which were calculated later from the position reports, averaged 14 to 18 knots below the predicted speeds. The accident report does not indicate the originator of the wind aloft reports used by the pilot nor how old they were.

Total mileage on the flight log came to 797 miles but the 18 miles from the destination range to the destination airport was not listed; neither was one 11-mile leg between an omni station and an intersection along the route.

It was easy to overlook this particular 11-mile distance in flight planning since, in the radio frequency charts, it is located close to the edge of the page and is near a terminal cluttered with numbers and words. In themselves, the distances were small, totaling only 29 miles, but in this situation they became critical.

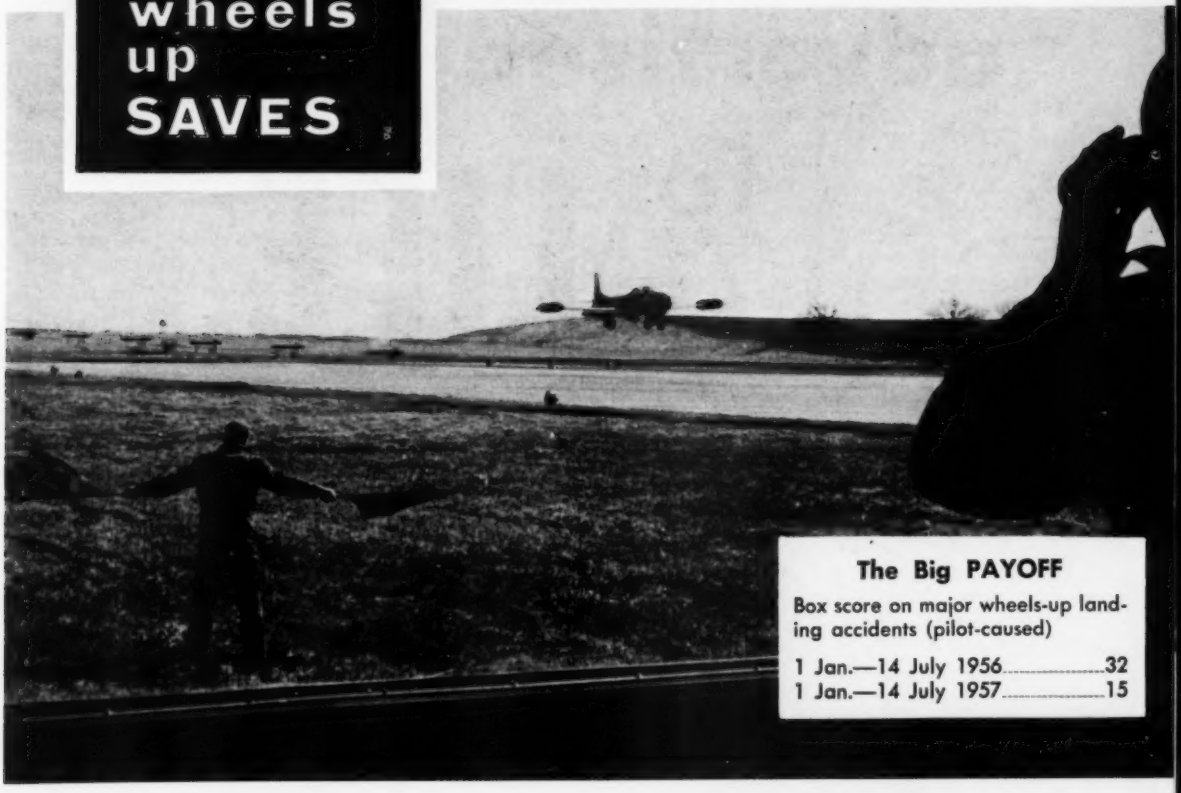
A second observation by the board is of interest. "(The pilot) demonstrated a lack of understanding of fuel use and endurance in the *Beech* when he indicated on the DD-175 that he had 6 plus 30 fuel aboard, then proceeded to cruise at 4000 feet with 1950 rpm and 27½" MP. Turning to the handbook, the published power settings nearest the ones used by the pilot (for 8000 to 7000 pounds gross) are 26" and 1800 rpm. At 5000 feet this gives a TAS of 149 knots, a fuel consumption of 43 gallons per hour. Under a no-wind condition this should take the aircraft 785 nautical miles using 220 gallons. There were 252 gallons available but part must be used for ground operation, takeoff and climb.

The *Beech* flew 807 miles at an average ground speed of 143 knots before running out of gas. The discrepancy between the actual and handbook figures are explained by the handbook: "the number of variables involved makes *very accurate* range predictions impossible, the ranges and fuel flow charts are conservative."

And now finally there comes the part which unfortunately can never be answered—Why didn't the pilot recognize the critical fuel situation? An unreliable fuel gage is part of the answer but a quote from one of the accident report endorsements may account for more of the error: "In this specific instance, it is felt that the flight was too easy . . ." Also the pilot had two hops preceding this cross-ountry. The fatigue from a total of 7½ hours flying (without a meal in 8 hours) was considered by the board to be a contributing factor to his faulty judgment.

Supporting this opinion was the condition of the flight log. About 50 percent of the "time over" fixes are logged in the first half of the log. In the last half there is only one recorded time over fix, and that at Wheeling, close to the destination. There are no actual groundspeeds recorded. The fuel planning log was blank and the en route fuel log was incomplete and inaccurate. The entries for one of the tanks used early in the trip indicate fuel consumption varied from 36 to 51 and back to 46 GPH though only one consumption entry is visible.

wheels up SAVES



The Big PAYOFF

Box score on major wheels-up landing accidents (pilot-caused)

1 Jan.—14 July 1956.....32
1 Jan.—14 July 1957.....15

BARTOW, M. R., BTG-1, 25 October 1956

Pilots forget to lower the landing gear all too frequently, but how hard can a pilot try to make a wheels-up landing? A student pilot on his first night solo experienced an electrical failure and came in to make a landing—wheels-up. Bartow saved him by firing Very's pistol flares and the pilot went around. On the next pass, the student pilot came in long and low and again, *wheels-up*. He actually had the throttle closed before Bartow could again wave him off! For his third attempt, the pilot lowered the gear and landed successfully. Score this as TWO saves for Bartow—successive landing approaches of the same aircraft.

1st Lt R. B. LAWES, VMF(AW)531 and SSgt S. L. STULCE, MCAS Cherry Point, 29 May 1957

The number one "saver" has done it again—Sgt. Stulce firing flares teamed up with Lt. Lawes, runway duty officer, who used radio to wave off an FJ-3 that was making a wheels-up approach. This is Stulce's SIXTEENTH save and the first for Lawes.

Additional saves are credited to the following persons (although space does not permit detailed reporting, each case merits a most hearty WELL DONE):

ALLEN, M. A., AC3	NAAS Kingsville	S2F
*BATTLE, L. S., LT	NAS Columbus	FJ-2
**CREWS, J., AN	VU-7	AD-5N
JOHNSON, L. N., Cpl HEUSTED, L. D., AC3	NAS Iwakuni	AD-6
REESE, R. N., AC3	NAAS Kingsville	F9F-5
*ROSENAU, E. C., AN TIPTON, L. V., AC3	VA-86 NAS Oceana	AD-6
RUSSELL, M. D., MAJ	VMF-218	S2F
SPIKER, R. J., AC3	NAAS Kingsville	F9F-5
STEWART, R B., AC1	NAS Norfolk	F2H
**STOLLBRINK, R. H., AC1	NAS New York	F9F-6
DICKENBACK, R. L., AA	NAS Memphis	F9F-6

* One previous save reported
** Two previous saves reported

as advertised for ... LIFE

MOST of the time we tell you about your fellow aviators who have trouble with their safety equipment and procedures; with life jackets, ejection seats, parachutes.

For a reassuring change, here's two first hand accounts of mid-air escapes which went off as advertised.

As a matter of fact, these survivors had such easy times they kept looking for trouble which wasn't there. One told himself, "just relax, relax and you may get out of this with just a few broken bones." He underestimated his equipment, and got out with a few relieved sighs.

The first pilot tells us:

"Deciding to eject, I reached up and took hold of the curtain, at the same time placing my feet in the stirrups. I had a little trouble putting my right foot in due to lateral G-forces. I pulled the curtain with both hands to the intermediate position, then reached for the emergency canopy ejection handle in case the canopy had not jettisoned. After looking, I was sure that it hadn't and started to pull the emergency jettison, but then realized the canopy was gone. I returned my hand to the curtain and ejected.

"I knew immediately I was clear, but have no recollection of blast. My first clear thoughts were that I was decelerating. I don't know just how this was sensed, since I hadn't let go of the curtain (*Not approved pro-*

cedure—Ed.) and remember hearing nothing.

"When I felt I was falling at a constant rate, I released the curtain and started to unbuckle the seat before realizing my feet were straight out in front of me. I easily replaced them in the stirrups, released my belt and shoved away from the seat with both feet. I took hold of the D-ring, which was found with little trouble, straightened my body and pulled the ring.

"I had no sensation of tumbling during the ejection. My visual sense seemed limited to my person, but this could be due to an overcast, which I might have been falling through. I did briefly see the edge of a cloud layer. I experienced great self-confidence while falling, feeling no pains. The opening of the chute was not felt, causing me to think it hadn't opened. Then I had to fight panic, realizing parachutes had been torn open. After an instant, I looked up expecting to see a streaming chute and discovered it open. I guessed myself to be at 10,000 feet, but on a later flight under similar lighting I checked and am now of the opinion I was at four to five thousand feet.

"The descent was normal, with a little swinging for no apparent reason, but that dampened out by itself. I could not sum up enough strength to lift myself into the seat harness or turn my body toward the direction of drift. Before landing I relaxed and felt nothing but great relief upon impact with the ground. The chute collapsed over a telephone line, so I had no trouble pulling it in."

The second pilot tells a similar tale.

"My thoughts leading up to the ejection were not primarily concerned with the bailout. I still had a firm belief that ejection would be unnecessary. (*Delaying the decision may be very fatal—Ed.*) The realization that I would have to get out brought no panic or fear. I had faith in the training and instructions I had received concerning ejection and I knew I had only to follow the steps and I would survive.

"When the engine flamed out I pushed over to maintain airspeed. I tightened all the chute straps and pulled the oxygen hose and radio jacks out of the alligator clamp and secured them in the cockpit. I recalled an All Pilots Meeting where we discussed the possibility of the oxygen hose delaying the seat separation. At the altitude I had (1500 above terrain) I realized a hasty departure from the seat was necessary.

"I made a conscientious effort to position my body properly. Not only did I straighten my back but I 'scooted' the lower part of my trunk as far back against the seat as possible by pushing on the side panels with my arms and I also tightened my chin strap.

"I remember feeling for the manual firing lever in case the canopy malfunctioned and didn't arm the seat. I then reached for the curtain and positioned my arms. The first 12-14 inches of travel blew the canopy. I realized the canopy had gone and I was free to go. I thought of the next step in the procedure. The shot out of the seat made me think that I had only one-half of a charge. It felt just like the ejection seat trainer.

"I remember that I felt relieved that I didn't have to release the seat belt. I had no sensation of 'going up.' The seat separated immediately and I had the sensation of doing a back flip.

"The oxygen mask and helmet came off immediately upon hitting the wind blast. (Ed. Note: *The Bureau of Aeronautics is currently conducting an extensive research program on helmet retention and it appears that an early fix will be effected.*) The blast wasn't severe or bone-crushing.

"I remember looking for the rip cord and finding it just where I expected it to be and I pulled it all the way out. I wasn't tumbling at the time.

"I thought the chute took a long time to open. I was thinking, 'just relax, relax and you may get out of this with just a few broken bones.' The opening shock was not overly severe, it was exactly what I had expected. As I drifted down I got the wind to my back simply by turning that way. There was an awful sensation of silence.

"I was trying to relax and think about the landing. I was drifting toward a wooded area and tried to think of the proper procedure. I thought that was to cross the legs and cross the arms in front of the face. (*Cross arms in front of face and keep them there. Keep feet and knees firmly together but don't cross your legs!—Ed.*) I did this and landed next to a tree. The landing was in soft earth and I tried to tumble in the direction that I had been drifting.

"I got out of the harness, picked up my chute and walked to a farm house to report my position to operations."

It was a good long block to walk to that darn farm house—that's my only complaint. ●

'It felt just like the ejection seat trainer.'

BACK in 1775 when Priestley first produced "pure" oxygen, which he called "dephlogisticated air," he suggested: " . . . though pure dephlogisticated air might be very useful as a medicine, it might not be so proper for us in the usual healthy state of the body; for, as a candle burns out much faster in dephlogisticated air than common air, so we might, as may be said, live out too fast, and the animal powers be too soon exhausted in this pure kind of air . . . Who can tell but that, in time, this pure air may become a fashionable article in luxury. Hitherto only two mice and myself have had the privilege of breathing it."

Ever since that time, divers, doctors, and aviators have been faced with fears, facts and fancy concerning the possible dangers of breathing oxygen. Even some naval air units have not been immune to mistakenly spreading misinformation on the subject.

From the information available it would appear that naval aviators need have no fear of temporary or permanent ill effects from breathing 100 percent oxygen at the pressures and within the time limits and frequencies now in operational use.

This conclusion can be drawn from a full review, compiled by the Naval School of Aviation Medicine, and other sources of existing observations and research available on the subject.

They suggest, "for the present it would seem inadvisable to breath pure (100%) oxygen at one atmosphere for greater than 8 to 12 hours at a time."

One atmosphere is about 15 lbs psi, exactly what you breathe when you breathe ordinary air at sea level.

When you're at altitude "pressure breathing," there is actually much less than one atmosphere pressure. It just feels like more because the pressure on the outside of your ribs, which helps you breathe out, is so very much less.

So, with present combinations and capacities of equipment as well as mission types, the pilot could not exceed the limits advised by the School.

Also, it has been shown that oxygen may be used at a pressure of 60 percent of an atmosphere or less for an unlimited time. Since 100 percent oxygen at about 13,500 feet altitude would have a pressure of about 60 percent of an atmosphere, *there is no danger at all in the use of pure oxygen above that altitude.*

Such lowered oxygen concentration makes the longer exposure harmless. Patients in a hospital, and their attendants, lived in 50 percent oxygen for two-and-a-half months with no bad effects.

Oxygen is toxic under some conditions. Effects appear as the pressure and time of exposure are varied.

At higher pressures, for instance at three atmospheres (about 45 psi), one researcher found impaired vision and the sensation of looking through a tube, after four hours.

With longer exposures to increased concentrations there may be discomfort too. A number of people breathing 100 percent oxygen without interruption at one atmosphere for 24 hours developed an ache under the breast bone, although the pain was not so severe as to end the test.

IS 100 % OXYGEN TOXIC?

Other effects from such unusual tests can be depression, inability to concentrate, fatigue, headache, and loss of appetite.

But to re-emphasize, pilots should not fear such effects with present use.

Notable is the variation in effects between individuals, and in a given individual at different occasions.

Dr. C. I. Barron, Lecturer in Aviation Physiology, Aviation Safety Division, University of Southern California, Los Angeles, in his lectures to Naval Flight Safety Officers' School advises, "there is no such thing as oxygen toxicity in aviation."

This statement is made in consideration of the maximum time-pressure relations in the use of oxygen under flight conditions. He bases his opinions partly on the recommendations for pre-breathing by the physiology section of the Aero-Med Lab, Wright Air Development Center; and his own experiences wearing his civilian hat as Medical Director for Lockheed.

However, there are certain problems possible under unusual situations which are discussed later in this article.

The WADC physiology lab has recommended two hours of *pre-*breathing routinely for USAF personnel flying in aircraft with performance capabilities in excess of 50,000 feet. This implies a minimum of three to four hours on 100 percent oxygen at both ground level and at altitude. They do not find that toxicity is a problem.

Dr. Barron says, "in our extensive experience at Lockheed, we have had pilots pre-breathe 100 percent oxygen at ground level for periods as long as five hours and to continue this while flying at cabin altitudes up to 25,000 feet for an additional hour. We have, also, had pilots pre-breathe for two hours, continue for one hour in flight, maintain their breathing on 100 percent oxygen for one to two hours at ground level after flight and then to continue breathing during a second flight for a total of six hours or more.

"We have had many pilots routinely pre-breathe for two hours at ground level and have yet to encounter a single case where either pilot sensations or laboratory tests could show evidence of toxicity."

There is one fact which can possibly explain some reports of supposed oxygen toxicity. The U.S. Naval School of Aviation Medicine wishes to emphasize the existence of a "paradoxical action of oxygen" which may occur when oxygen (or even air) is breathed *after a period of hypoxia.* The reason for this is not understood but there is apparently a decrease in blood supply to the brain. Disturbances include errors of judgment and sensations of elation or intoxication.

Fifty-two people were exposed to a simulated altitude of 20,000 feet for four to five minutes to produce hypoxia, and then given oxygen. They showed increased errors in a writing test.

Paradox reactions have occurred in flight.

An aviator might assume that hypoxia, like other ailments, is better prevented than cured.

Don't wait for the symptoms of hypoxia and then start oxygen to correct it. Start oxygen before you need it and avoid the "paradoxical action."

FLIPPED YOUR LID LATELY ?

WHETHER you have or not, the problem of APH-5 helmet stability should be of personal concern to you. BuAer is currently working on the problem that arises when you decelerate suddenly — and your hardhat keeps right on going. Several good suggestions are being considered and evaluated; until one is adopted, tighten that chin strap and *don't flip your lid!*

Seems like some fly-folks have been greatly embarrassed at having their APH-5 rotate forward upon sudden deceleration. Some have voiced complaints on the subject. BuAer has been asked to look into the matter and to consider several suggested remedies.

The problem of helmet rotation stems largely from the design necessity that a wearer be able to look straight up without digging the helmet against the back of his neck, as is the case with the H-4. This required a contour at the rear of the helmet which prevented its being retained by the nape of the neck upon sudden deceleration.

As a possible deterrent to this condition, BuAer is currently evaluating a helmet modification which, *when used with a properly tightened chin strap* is expected to alleviate the situation without discomfort during normal wearing.

If you're selected (or volunteer) to evaluate a modified helmen with a 'rear chin strap' which, to be technically correct, is a 'nape strap', wear it as recommended and forward your recommendations and comments to Chief, Bureau of Aeronautics, Department of the Navy, Washington 25, D. C., Attn: Aer-AE-5221. (*Comments on equipage may also be sent via Anymouse Report to NASC.*) Be sure to indicate your impressions of the comfort of the strap, and whether you feel it improves the stability of the helmet. Indicate too, whether you wear your chin strap tight, and your thoughts about the material used in the chin strap and nape strap.

BuAer stresses that the two most important considerations for safe, efficient wear of the helmet are *proper fit*, and *proper utilization* of the chin strap. A preliminary survey on the helmet retention problem indicates that many a pilot is improperly fitted and, in addition, does not tighten the chin strap during flight.

The use of too large a helmet size causes the following conditions:

Stability is minimized. (A snug fit, just short of uncomfortable tightness, provides the optimum in both safety and comfort.)

Good radio reception is sacrificed. (A proper seal around the ears attenuates undesirable noises whereas a poor seal permits noise leakage into the ears.)

A weight penalty is paid for the larger helmet.

The visor integration with the nose usually is very poor.

Fitting recommendations are contained in BuAer Aviation Clothing and Survival Equipment Bulletin No. 5-57, which should be in your readyroom about the same time as this issue of *Approach*—if you don't see it, ask for it.

Same helmet, new subject: If you're convinced that it's pretty hard to be a cool-headed aviator while wearing the APH-5, you'll be interested in BuAer's ACSE Bulletin No. 3-57 too, which outlines a method of covering the sponge rubber sizing pads in the subject helmet with *chamois*.

At the discretion of each pilot, the pads may be covered with chamois for the sole purpose of reducing discomfort caused by the combination of heat and direct contact of the head with the sponge rubber pads.

Heat measurement tests — which were conducted at the Air Crew Equipment Laboratory, on the H-4, the Air Force P-4, the standard APH-5, a white APH-5, and other APH-5 helmets with leather-covered and chamois-covered pads—indicate that none of the helmets offered any greater physiological protection than the standard APH-5 helmet.

As a result, ventilation studies have been initiated as well as investigations of modifications which include substitution of a new type polyurethane for the present padding, and the incorporation into the helmet of a rubber dam across the forehead. In addition, a quantity of leather-covered and segmented pads are being forwarded to the Fleet for subjective evaluations. •

DOWN UNDER

AS FAR back as 1945, an imaginative man suggested that it might be possible to use portable aviation oxygen equipment for coming to the surface from submerged aircraft. Some indoor tests were made, but for practical purposes the matter ended with a written report.

Navy interest revived with a 1952 report on experiments conducted by the School of Aviation Medicine at Pensacola and then VC-62 (now VFP-62) carried out some experimental work with an oxygen-equipped Dilbert Dunker. Full flight gear was used in the VC-62 tests and some good training experience resulted.

In 1956 the School of Aviation Medicine put out another report concerning the indoctrination of several preflight classes in underwater breathing. In all the reports the conclusions remained the same: *underwater breathing with standard console mounted operational oxygen regulation equipment is possible and practical.*

Emergency Training Valuable

From the reports it is indicated that an actual emergency situation would have better results if the pilot has received previous training. However, whether or not such facilities are available to you the experiences of VC-62 and the School of Aviation Medicine will provide some familiarization with the requirements for successful underwater breathing.

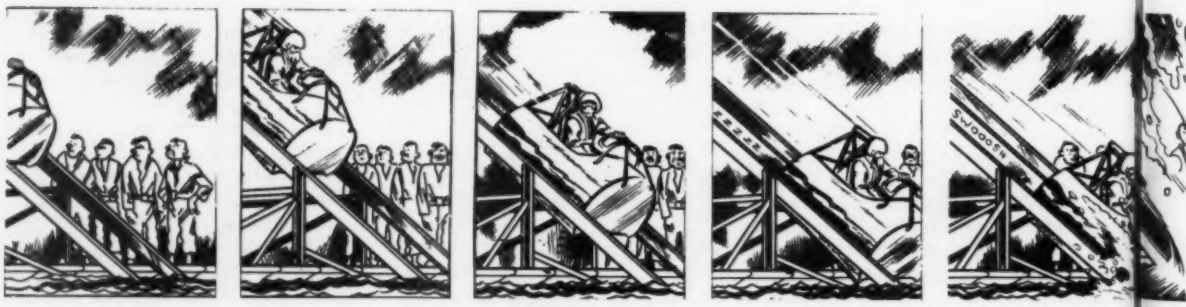
Obviously the use of oxygen equipment under water is based solely on the chance that a normal escape from a ditched aircraft may not be possible. In such cases underwater breathing provides the extra time needed for escape while the aircraft is sinking.

Both the A-13 and A-14 masks were satisfactory and any standard naval aviation oxygen regulator now in use will suffice. The liquid oxygen system will have no effect noticeable to the man in the cockpit.

Successful to 100 Ft.

Tests performed by the School of Aviation Medicine show that the oxygen regulator type 2867-A1B (automatic positive pressure diluter demand), presently used in most naval aircraft, can sustain life under water to a depth of at least 100 feet *if set to deliver 100 percent oxygen.* Previously the maximum depth tested was 65 feet and various types of naval aviation equipment were taken to that depth.

When full, the generally standard 514 cubic-inch oxygen cylinder furnished adequate oxygen for an average duration of 31 minutes at a depth of 33 feet. Forty feet on 100 percent oxygen is recommended by the Naval



Should you be trapped in the cockpit underwater following a ditching, your chances of survival may be increased by breathing techniques discussed here.

Diving Laboratory as the safe depth for one-half hour if the man is exercising.

100 PERCENT, a Must

Commander A. L. Hall, MSC, who has led in much of the underwater breathing development, found that the only requirements for successful operation were that the oxygen mask had to be properly fitted and the regulator turned to 100 percent oxygen (diluter OFF).

The function of the diluter is to mix cabin air with the oxygen in normal use and if allowed to remain open under water, the water will mix with the oxygen—an unfortunate situation. Carrier doctrine for many squadrons is to make all launches and recoveries on 100 percent oxygen.

A number of different effects were noted when using diluter demand oxygen equipment under water. The ideal position of the regulator in relation to the pilot is when the regulator and mask are in the same horizontal plane. When at the same level there is no differential pressure.

If the regulator is lower, as in an upright cockpit, oxygen pressure is positive and breathing under water is similar to pressure breathing, with exhalation slightly difficult.

When the cockpit is inverted the regulator is above the mask and inhalation becomes quite difficult. *Positive inhalation* action is required to draw the oxygen from the regulator. If there is trouble breathing, get the neck as close to the regulator as possible. In many cockpits, bending forward in the cockpit seems the only practical way of getting the neck close to the horizontal level of the regulator.

The H-2 bailout bottle is *not* satisfactory *under water*. This cylinder delivers oxygen under constant flow but the volume of the oxygen line from the cylinder to the mask is so small that a full breath reduces the pressure in the line to the extent that water is admitted through the one-way valve in the end of the oxygen mask hose.

When a water landing is imminent the regulator should be on 100 percent oxygen (that point can't be overstressed). The mask should remain on as long as the pilot is in the cockpit and should be disconnected last.

In all the tests conducted, the quick-disconnect functioned perfectly. When the hose is stretched to a point outside the cockpit the disconnect breaks of its own accord.

Don't Hold Your Lungs Full

The question arises that if the pilot has been forced to ride the plane to any great depth, will he

Please turn page

DOWN UNDER

Continued

drown before he reaches the surface of the water? In answer, the School of Aviation Medicine says that routine escapes are made from 100-foot depths without outside breathing supplied.

In fact this is a point to remember.

When coming to the surface, the air that is in the lungs will expand as the water pressure decreases. The lungs cannot resist the expansion of the air from any great depth and the air *must be vented* into the water all the way to the surface. This of course is contrary to the normal reaction to hold one's breath as long as possible in such a situation.

The man will be able to determine how much he should vent on the ascent since the lungs will become unpleasantly full before damage results. On reaching the surface be sure to remove the mask as the open end of the mask hose will be underwater.

Exposure Suit Technique

Use of the Mk-4 exposure suit required a change in the technique previously advocated for evacuating an inverted cockpit. Previous doctrine directed the escapee not to use his feet to push out of the cockpit. But it was found that the buoyancy of the exposure suit definitely requires *the feet to be used.*

The technique decided on by VC-62 was to wait for all motion to cease, then unfasten the safety belt and radio cords, grasp the windshield with both hands and commence a flutter-kick with the feet, moving them back to the seat. This requires only a very few seconds but is necessary to overcome the tendency of the buoyant exposure suit to trap the pilot inside the cockpit when in the inverted attitude.

Test Procedures Used

In the introduction of underwater breathing to preflight personnel, the School of Aviation Medicine reasoned that when first exposed to submerged breathing by being inverted underwater following "precipitous entry into the water in the Dilbert Dunker," the man might tend to be disconcerted. Accordingly, a carry-around oxygen system was built for the trainee's first use. Each man was allowed to enter the shallow water of a swimming pool with this apparatus and swim or crawl underwater across the pool. If he became apprehensive while breathing under water, he could stand up and his head would be out of water.

After satisfying himself that the procedure was safe, the trainee was then placed in the oxygen-equipped dunker for further indoctrination.

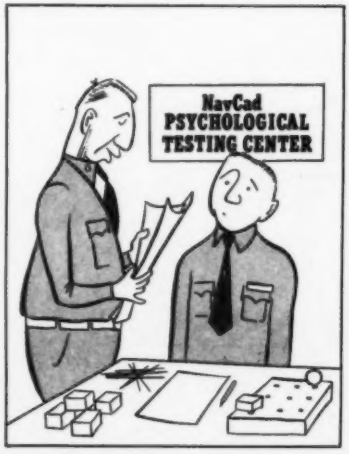
VC-62's experience with the oxygen-equipped dunker was similar. It was determined that a pre-indoctrination in the different breathing techniques to be used was advisable. The indoctrination was followed by a run in a Dunker. Semi-opaque goggles were used in the runs to simulate the darkness of deep water.

Under some circumstances there is insufficient light even during the day to see at a depth of 10 feet. So every thing must be done by feel.

Once the feet touch the seat, exit the cockpit with a simultaneous pull by the arms and a push by the feet. Once free, the exposure suit performs equally well as flotation gear and as protection from the elements.

Suffice it to say that obviously neither this training nor an actual experience is pleasant—but the 20/20 hindsight of those who have had either sure supports a training program!

Modifications required on the Standard Dilbert Dunker, sample lectures and other underwater breathing information were issued in Special Report No. 56-4 by the School of Naval Aviation Medicine, NAS Pensacola. Interested squadrons could supply required gear to supporting air stations, but modification and maintenance would have to be accomplished by air station or public works personnel.—Ed.



"After adding up your scores, Cadet, we find that you are best suited to pick up sticks."

NOTES from your FLIGHT SURGEON

LONGEVITY REQUIREMENT

Training! Possibly that sounds like a disagreeable word to you. Just remember though, a few minutes of the proper training may keep you in business long enough to become a lovable old grandfather.

NO TRAINING

No training is just as dangerous as no time.

Two TV aviators (not to be confused with drugstore cowboys) found it necessary to eject. The copilot was delayed about a minute because adjustment of the lapbelt buckle interfered with the arming action of the right armrest. Also, he had pulled his goggles down over his eyes but windblast caused them to flap so much that he threw them over the side.

The pilot armed his seat but repeated efforts and squeezes with both hands on the trigger failed to fire the seat. He stood up to bail out, and was thrown up and to the left, missing the tail surfaces. After three fumbles he pulled his D-ring.

Neither pilot had ever had formal training or lectures in ejection seat use nor any recent instruction in bailout procedures.

Both read a lot about these two methods of escape, and have received informal checkouts by other squadron personnel. The pilot had a run in the low-pressure chamber about two years ago, but the copilot had not had one for many years.

The fact that both men escaped is a tribute to their refusal to panic at time of emergency, and their ability to remember what they had read about survival procedure.

Air stations should maintain a complete safety and survival training course for its pilots. Conformance to the requirements of OpNav Inst. 3740.3A would not have allowed two pilots, relatively untrained in safety procedures, to fly this aircraft.

VERTIGO AGAIN

An AD-6 pilot took off as second man in a three-plane night bombing and rocket mission. The sky was dark and horizons not very satisfactory for reference points. The area was covered by clouds, so the flight returned towards the field. About four or five miles out at 1200 feet the section leader broke formation to begin landing descent.

The second pilot began a climbing left turn, stated he had vertigo and asked if he were upside down. Number three man advised him he was in a left bank, to roll right wing and check his gyro. He complied but stated he still had vertigo, and began a shallow dive. After he passed through 1000 feet No. 2 man called to pull up and re-check his gyro.

He pulled up at 400 feet, flew straight and level a short time and then went into a steep, diving right turn, hitting the water in a 45-degree dive, 90-degree right bank.

The wingman states, "I think he looked at the air station lights as he pulled out of the dive, thought he was inverted, and abruptly tried to roll level."

When YOU get vertigo, your only hope is to concentrate on and believe your instruments.

FUEL FUMES FATAL TO MECHANIC.

"This article reports the death of a mechanic from exposure to fuel vapor. The mechanic had entered an unventilated cell to stop a fuel leak at the mounting flange of a fuel booster pump. Exposure to the vapor was estimated to have lasted about seven minutes. The mechanic was given artificial respiration and treated with an inhalor but died without regaining consciousness.—CAA AvToxicology

UNSUITED

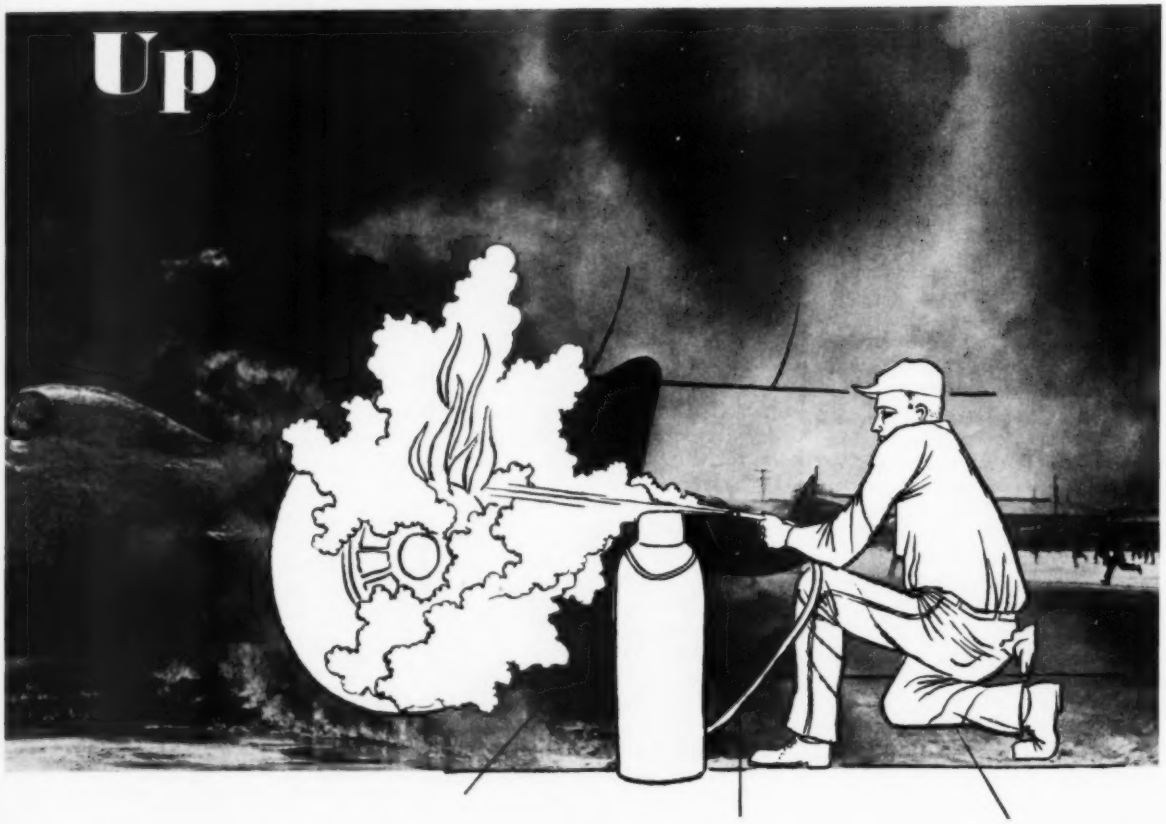
The HO4S-3 was shuttling personnel and cargo between two ships. Someone suggested wearing exposure suits, but they weren't worn because someone else said the ships were so close and both had crashboats ready in a standby condition.

The sea was quite rough with about 10 percent ice coverage. At times the intermittent fog thickened to blank one ship from the other, and takeoffs were delayed until it lifted. After many trips the HO4S-3 crashed into the water. Before the pilots could inflate their life jackets their hands were too cold and numb to even feel the CO_2 release cords.

They clung to convenient cakes of ice and, fog cooperating, were rescued within five minutes with no permanent injury.

Exposure suits, anyone?

Ground Up



FIGHTING WHEEL FIRES

APPLICATION of TMB (trimethoxyboroxine) to an F9F wheel fire, which had resulted from excessive braking, caused the fire to flare up and damage the aircraft's flap, hydraulic (flexible) lines and an actuating arm.

Although the use of TMB fire extinguishers is BuAer approved for use on fires which occur in the magnesium structure of aircraft (BuAer Inst. 11320.12), BuAer also cautions that because of its

unusual characteristics this agent presents more exacting techniques in handling and application.

The Instruction notes that TMB will readily extinguish burning magnesium but this agent itself is a flammable liquid. *It has a flashpoint of approximately 55°F and should be handled accordingly.*

Some of the things to remember in fighting a magnesium fire is that TMB is flammable and when it is first applied on the fire some of it will immediately be vaporized, resulting in a sudden flareup of flame and a cloud of white non-toxic smoke. The size and intensity of this flareup depends on the area of fire covered by the TMB and the direction and force of the wind present.

Magnesium is not easily ignited, but burns violently when on fire. Therefore, it is very important that the fire be extinguished as quickly as possible.

It is not always necessary for flame to be present to create a dangerous condition. During the cooling-down period, heat from the brake and wheel may "cook" the tire and tube, weakening the rubber so that it will blow out. To aid in cooling hot brakes, a stream of compressed air should be directed in and around the brake and wheel assembly. *Do not use any rapid-cooling agent unless fire is present. Remember, dry chemical is recommended for brake fires.*

Even though fire is not present, it is advisable to clear the area around the wheels (especially outboard of the brakes) of personnel. Only one man, with extinguisher for applying dry chemical, should be stationed near each wheel. His position should be to the rear and parallel to the line of wheel rotation. If at all possible, this man should be a member of the fire-fighting crew. He should be equipped with protective gear.

TUBELESS TIRES EXPLODE MORE VIOLENTLY—The report of an incident involving the blowout of a tubeless tire on an F3H-2N brought about the following comments of interest from the reviewing CAG.

Five minutes after the aircraft was parked on the line following 35 to 40 minutes of taxiing the tire exploded violently causing shrapnel damage to the aircraft. The explosion was attributed to brake heat dissipation into the wheel assembly causing expansion of tire air to the point the tire had blown. There was no known or suspected main-

Continued next page

THE CAUSES OF WHEEL EXPLOSIONS . . . .

Studies indicate that fire in a wheel will not necessarily cause it to fracture, because the wheel will normally withstand considerably more pressure than the tire. However, the sudden cooling of a hot wheel by application of an improper extinguishing agent such as CO_2, water or foam, can cause it to fracture, thus permitting the tire to blow. This fracturing is caused by rapid, uneven cooling and contraction of the wheel. CO_2, for example, chills on contact and gives uncontrolled, spot cooling, and when applied to hot metal, it sets up stresses which can cause fracture. Magnesium, being a high expansion metal, is especially susceptible to the type of internal stress caused by such severe spot cooling. Burning magnesium, when brought into contact with a liquid, is apt to explode.

Where a wheel explosion has occurred some time after the fire is out, the tire pressure may have built up because of continued heat-transfer from the wheel to the tire. The increased tire pressure, plus the presence of a wheel fracture, can form a combination sufficiently critical to explode. It is interesting to note, however, that mere heat is not likely to be sufficient to blow a tire by increased air pressure alone. A tire normally carrying a pressure of 110 to 120 psi, when tested by its manufacturer in runs up to 500°F, showed a pressure increase of only 15 to 20 psi. A tire will begin to deteriorate at 375° if held at this temperature for any length of time.

Some information in this article and others on this page courtesy of DOUGLAS SIS.—Ed.

FROM

THE

GROUND UP

Continued

tenance error. The tire was reported in good condition and serviced to correct pressure.

The CAG notes that taxi time on this aircraft, although higher than normal, is not considered excessive for occasional operational requirements. The heavy gross weight of the aircraft, combined with the high residual thrust of the J-71 engine, makes necessary the heavy use of brakes to keep taxi speed under control.

Heat dissipation in the brakes is primarily by conduction through the tires. This is satisfactory while the aircraft is in motion and the tire is constantly presenting a new surface to the cool surface, but in the static condition cooling is insufficient.

The danger of this situation is compounded by the entry into service use of the tubeless tire.

The tubed tire will blow before dangerously high pressures develop, whereas the extra strength of the tubeless tire results in the tire holding until pressure rises to the point where an extremely violent explosive blowout occurs.

This squadron has developed line procedures and signals so that the pilot may warn personnel to stay clear of the aircraft when he suspects excessively hot brakes. The squadron is manufacturing a combination chock and blast fragment screen for evaluation.

The problem of brake heat dissipation is expected to increase with the entry of each new type aircraft into service use.

MATING SEASON—A recent Safety AMPFUR reported the loss of an A3D-2's hook-point causing a bolter landing. The nut, Part No. AN-310-12, used for securing the hook-point was recovered on the flight deck. Inspection of same revealed stripped threads. An inspection of spare nuts and bolts rejected 5 of 16 nuts in stock. Use of close tolerance bolts with mated nuts was recommended to insure proper fit.

OVERVOLTAGE CONDITION IN FJ-2 AIRPLANES—A recent accident occurred during takeoff of an FJ-2. The accident was caused primarily by an overvoltage condition which resulted in overspeeding of the aft fuel boost pump and an increase in fuel pressure causing the low-pressure fuel filter bowl to fracture. An explosion and fire resulted. The airplane was crash-landed and the pilot evacuated safely.

To prevent a recurrence of this type of accident, it is recommended that the following procedures be given immediate attention:

1. Inspect all low-pressure fuel filter bowls for damage (cracks and deformation). Also, check all filter bowls for incorporation of FJ Aircraft Service Change No. 332 which prevents overtorquing of the bolt that secures the filter bowl.

2. Check all aircraft to ensure that FJ Aircraft Service Change No. 371 has been incorporated. This change ensures that the battery and voltage regulator access door support arm will not inadvertently strike the regulator or wires, thereby causing a short. (Refer to Service News, Vol. V, No. 10, dated 22 June 1956, for further explanation of FJ Aircraft Service Change No. 371).

3. All FJ-2 activities concerned should take immediate action to ensure early incorporation of FJ Aircraft Service Change No. 374. This change provides overvoltage relays and components for overvoltage protection of the d-c electrical system.

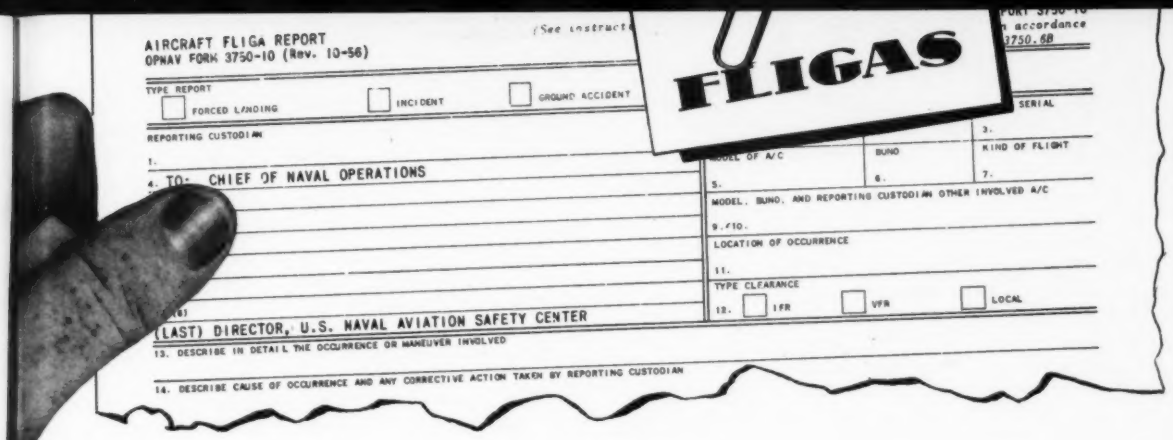
Every effort is being expended by the contractor to provide kits of FJ Aircraft Service Change No. 374 to the field as soon as possible.—*North American Aviation.*

SHOOTING TROUBLE—PULLS WRONG CABLE—An F9F-8B was on the hangar deck for a tire change and troubleshooters were trying to work off a shoulder harness gripe at the same time to ready the aircraft for the next launch.

A mechanic kneeling on the seat facing aft used his left hand to attempt release of a suspected jammed shoulder harness lock unlock cable. With the canopy on, he was unable to observe the vicinity of the cable and apparently grasped the seat eject cable. The seat eject cable is the same gage as the lock unlock cable and is about three inches removed. The seat fired, ejected and injured seriously the mechanic in the seat.

YEAH, MAN!

You may think the failure of the whatsis-whosis is an isolated case, just as the author of a recent FLIGA did. But the fact was that four instances of the same breakdown were already on recent record. SO—please report 'em!



⑬. An F9F-6 was being tested for elevator control during takeoff run. On the previous scheduled flight the pilot aborted during takeoff run because of a nose-heavy condition. Two highspeed runs were made from the duty runway (8000') attaining a maximum speed of 120 knots utilizing different tab settings before braking to a stop. It was evident during the last 2000' of the second rollout that the brakes were overheating resulting in very poor braking action. Maximum brake pressure was necessary to slow plane for the turnoff at the end of the runway. The plane had taxied approximately ¼ mile toward the line when the right tire blew. The tower was contacted and engine and switches secured. A light CO_2 crash truck drove up and informed the pilot the right tire was burning. The two men in the crash truck broke out CO_2 bottles and started fighting the fire which was very small at this time. Within 30 seconds the left tire blew and shortly started burning. The fire would slow down slightly during application of the CO_2 but continued to gain momentum as time went on. Approximately five minutes later a foam truck came out and immediately extinguished the fire.

⑭. This accident could have been avoided if a reasonable length of time (10-15 minutes) had been observed between runs. Damage would have been minimized to blown tires and brake assembly if a foam truck had been sent out immediately to back up the CO_2 truck in extinguishing the fire. ***(Please see "Wheel Fire Fire-Fighting," page 32.)***

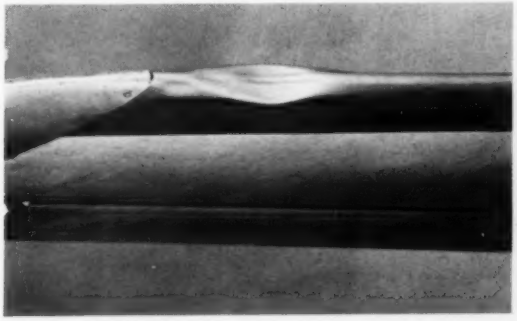
⑬. FORCED LANDING, AD-5: While in normal flight, RPM increased slowly. After a brief check, RPM remained between 2700-2900 with no positive control from the cockpit with the prop control.

⑭. Disconnected prop linkage at governor control. Suspected maintenance or inspection error and/or material failure or malfunction. Bolt connecting the prop control cable Part No. 4388412 at the REB3N end cable to the prop bellcrank idler assembly, Part No. 3432729, was missing.

⑬. The pilot was making touch-and-go landings in an F9F-5 and after becoming airborne retracted the landing gear. A normal approach was made and the pilot noticed he was sinking lower than usual in his flareout. At this instant he heard a scraping sound, applied full power and became airborne. Landing gear was lowered and a landing was made without further incident.

⑭. Continued emphasis is being placed on the strict adherence to all checkoff lists. Pilots have been directed to leave the wheels and flaps in the down position when in the touch-and-go pattern or following a waveoff if he does not intend to leave the pattern. It has been reemphasized that in the event of an incident involving possible damage to the aircraft the pilot is responsible for obtaining a visual check, whenever possible, from a chase pilot and for stalling of aircraft, at altitude, prior to making an approach.

⑬. A member of the catapult crew was struck on the lower forehead by the starboard horizontal stabilizer of FJ-3 as it was catapulted.



⑭. The man was standing in the path of the catapulted aircraft. He sustained only Delta injury.

FLIGAS

Continued

REEL GONE!

CASE I

⑬. The AD-6 was spotted portside aft on a 50- to 60-degree diagonal to facilitate wings spread ordnance loading. The plane is believed to have been secured with a three-point manila tie-down augmented with chocks under the main landing gear. The plane captain was sitting in the aircraft with the canopy closed. The ship went into a high speed starboard turn and the aircraft which weighed 20,000 lbs. snapped the tail line, evidently slipped the starboard tie-down due to a faulty knot, broke and carried away the port tie-down, slid out of the chocks, rolled to the deck-edge unchecked and fell over the side inverted.

CASE II

⑫ FJ-3M required an engine turnup for completion of a periodic inspection. During the inspection a brake cylinder had been replaced and the brakes were to be bled with the engine turning up. The FJ was moved from the hangar deck via elevator No. 2, to the flight deck level for turnup. The plane captain informed the director that no braking action was available. A tractor was attached and the aircraft slowly moved to the position, for spot, port side just forward of the landing signal mirror. At the director's instruction, one man followed closly by each main wheel with a chock. Because the spot was limited in space to other aircraft parked on either side, the tractor was removed to

CASE III

⑬. FJ-3 rolled into port catwalk of the ship from its respot position. See photographs.

⑭. The aircraft was spotted foremost on the port bow along the deck edge for night recovery. The foremost spot on a CVA is spotted at an angle of about 40 degrees to the centerline of the ship. Therefore the aircraft parked in this location, almost broadside to the wind, is subject to a greater impact from the wind than aircraft spotted longitudinally along the deck. The plane captain states he secured his aircraft with six nylon tiedowns leading both fore and aft. His tiedown was subsequently inspected by the line petty officer and found to be secure. The plane captain then manned the cockpit of his

⑭. Inadequate tie-downs for aircraft in heavy configuration.

Failure on part of plane captain to be alert and apply brakes.

Combination of starboard turn by the ship and the spotting of planes facing portside outboard on a diagonal heading.

It is recommended that:

Aircraft be spotted fore and aft for loading.

Plane captains be reindoctrinatd on danger of aircraft movement during high speed turns.

That plane canopies be left open while plane captains are manning aircraft unless inclement weather prevents.

SECOND ENDORSEMENT:

The recommendation that aircraft with external stores be spotted fore and aft is not concurred in. However, in the future spotting will be at an angle not greater than 30 degrees from the axial (accepting a limited hazard from the accidental firing of rocket type stores).

Nylon type tie-downs have been on order for a considerable length of time. When received they will be used for all AD tie-downs.

All safety precautions for deck handling of aircraft have been reemphasized. In addition, plane captains are instructed that while they are in the cockpit, canopies will remain open and seat belts will be fastened.

A comprehensive investigation indicates that the plane captain was experienced in his duties, that he knew the precautionary measures expected of him and that his failure to remain alert was a probable heavy contributing factor to the accident. No evidence of willful or culpable neglect was found nor was it indicated that safety measures then in effect had not been carried out.

facilitate maneuvering the FJ. As the aircraft was slowly being pushed rearward toward the deck edge the ship commenced a starboard turn. The deck rolled port side down and the director called for chocks. Chocks were immediately placed on both main wheels but they skidded across the wet deck. The wheels contined to roll within the chocks.

The plane captain, aware of the impending accident jumped to the deck.

⑭. The primary cause of the accident was the director's decision to free the FJ from the tractor before the spot was completed and the aircraft secured.

Secondary causes contributing to the accident were a wet and rolling deck.

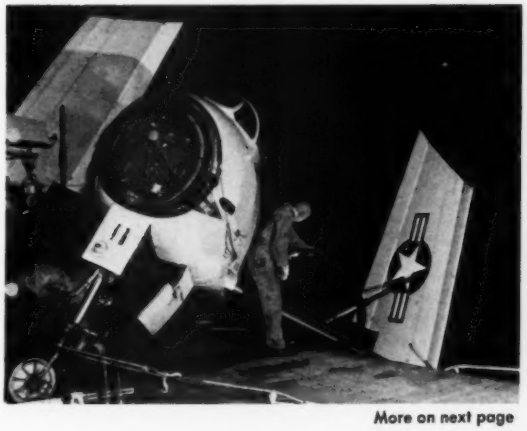
The squadron maintenance officer has taken corrective action to assure in the future that aircraft will not be moved, except in emergency situations, without brakes that are functioning properly.

aircraft and promptly dozed off. At approximately 2015 the aircraft parted its tiedowns and rolled backwards into the port catwalk.

The first of the squadron investigative personnel to reach the scene of the accident report there were only the remains of three nylon tiedowns attached to the aircraft. Hurricane reels were rapidly attached and the plane was prevented from falling over the side.

Personnel error is presumed to be the major contributing factor to the accident as concrete evidence indicates the aircraft was not adequately secured to withstand a high velocity of relative wind or ship's maneuvering. The wind over the deck was 350 degrees relative at 35 knots. The sea state was moderate and the ship was not pitching or rolling noticeably.

To re-emphasize the paramount importance of aircraft security, regardless of time or location on board, a vigorous program of re-indoctrination of plane captains has been initiated.



More on next page

FLIGAS

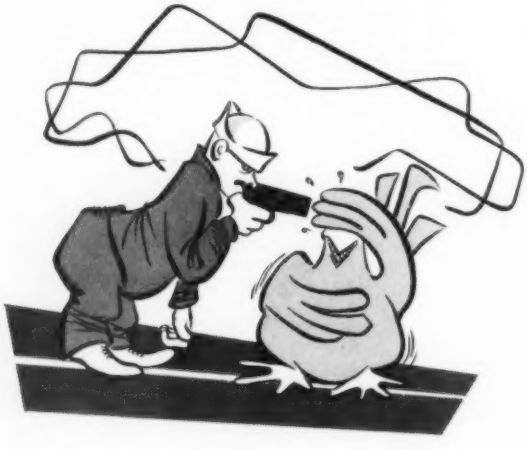
Continued

13. F9F-8B nosewheel compartment fire. Subsequent to engine turnup maintenance personnel check the operation of a replaced hydraulic valve in flaperon system.

14. The mechanic turning up aircraft engaged the inverter circuit breakers causing a hot lead from the inverter circuit to arc through a hydraulic line and ignite hydraulic fluid in nosewheel compartment. Prior to this the inverters had been removed, and the lead was in contact with the hydraulic line. Squadron maintenance procedure has been not to engage inverter circuit breakers when inverters are removed from the aircraft.

A standing work order now requires that all maintenance personnel will be fully cognizant of the status of an aircraft before they begin work, and that electrical leads temporarily disconnected will be taped to prevent inadvertent grounding.

13. A P4Y with 10 passengers and 6 crew members aboard was making a GCA monitored takeoff and just as aircraft became airborne a flock of birds flew in path of aircraft. One seagull went thru No. 3 prop, struck the oil scoop, and imbedded over and between Nos. 11 and 13 cylinders. Damage to oil scoop was discovered after reaching cruise altitude. A landing was made at an AFB. The bird was removed, engine prop and cowling inspected, and flight was continued.



14. Operations and tower personnel have been instructed to continue to use a VERYs pistol flare for clearing birds from the runway area if necessary. *Normally, a red flare will keep sea gulls away for several hours.*

13. Engine air duct guard assembly had been placed over the port engine inlet duct of an F2H-4 and during ground run-up a washer and 3/8-inch (castellated) nut parted from the guard assembly P/N R82MDA-MDE2363-1 and ingested by the engine.

14. Parting of nut and washer from engine air duct guard assembly. Each guard assembly had been inspected and a work order initiated to braze the pin and (castellated) nut to the guard assembly. Plane captains are instructed to inspect guard assemblies before placing over the engine inlet duct prior to each run-up.

Inspection error in that the section leader of F2H-4 noticed the nut on the guard assembly was loose and did not take corrective action by failing to tighten the nut securely.

13. Prior to leaving the jet ramp on a local training flight, the pilot of a TV-2 fully closed the canopy and attempted to lock same. However, he grasped and actuated the canopy jettison lever which fired the canopy over the vertical stabilizer.

14. The pilot failed to ascertain which control he was actuating.

13. The F9F-5 was being worked on by two separate groups of maintenance personnel, one to correct a landing flap discrepancy and the other to safety wire the emergency air bottle T-handle for lowering the landing gear. Both groups were working on the aircraft at approximately the same time, however the safety-wiring of the T-handle was completed prior to correction of the flap discrepancy. Both groups were in the cockpit of the aircraft immediately prior to the accident. After completion of the corrective action on the flaps, the emergency hydraulic pump was utilized to build up pressure in the hydraulic system. As the system pressurized, the landing gear doors opened. The landing gear handle was checked and found to be in the UP position. The handle was immediately placed in the DOWN position, the landing gear doors closed and the wheel indicator indicated down and locked. The flap operation was then checked and found to be unsatisfactory so preparations were made to move the aircraft into the hangar for futher investigation of the discrepancy. The aircraft was moved approximately 18 inches when the starboard main landing gear collapsed.

14. Squadron maintenance personnel failed to properly insure that the landing gear was down and locked prior to attempting to move the aircraft after application of hydraulic pressure to the hydraulic system with the landing gear handle in the UP position.

The landing gear handle was placed in the UP position for purposes unknown, by persons or a person unknown but assumed to be one of the two groups of maintenance personnel working on the aircraft just prior to the accident, without; (a) Notification of personnel with authority to authorize this act; (b) Authorization, and (c) without returning the landing gear handle to the DOWN position and taking proper steps to insure the landing gear was down and locked.

The maintenance group working on the flap discrepancy failed to check the position of the landing gear handle prior to building up hydraulic pressure in the hydraulic system and erred in not insuring that the landing gear was in the DOWN and LOCKED position by drop check after the landing gear unlocking process was started and then reversed. ●

MURPHY'S LAW ★

MURPHYMOUSE

We received a built-up engine for one of our P5Ms from the FASRon. Trouble: the oil and fuel transmitter lines are alike—same size and color. So they hooked them up backwards.

Result: on turnup there were low fuel pressure indications due to the different viscosity. The mech attempted to adjust the fuel pressure. It was no go even after he screwed the adjustment all the way home—at least there was no indication of it. Little did he know he had pressure he hadn't used yet.

So what happened? The pressure was actually way above limits—Blew the gasket out from under the fuel pump! What a fire we had!

ANYMOUSE

P.S. Sorry, no pictures.

★ IF AN AIRCRAFT PART CAN BE INSTALLED INCORRECTLY, SOMEONE WILL INSTALL IT THAT WAY.

TIP TANK

Miscellaneous aviation safety information

HIGH & HOT WEATHER TAKEOFFS

It is possible to get airborne under extremely hot conditions, but on the wrong side of the power curve. The aircraft would be placed in a precarious position in which an accident is almost certain to occur.

Thumb rules for jet takeoffs are:

- *4% to 5% loss of thrust per 10° F. rise in ambient air temp above seal level standard—*
- *2% to 3% loss in thrust per 1000 feet elevation above sea level—*
- *for each 10° F. ambient air temp above sea level standard of 60° F. increase your takeoff rolling distance by 10%—*
- *for each 1000 feet of elevation increase your takeoff rolling distance by 10%—*

JUST LOCAL?

Flying local only? That can be a "fur" piece sometimes. How long since you or your ops people checked the NOTAMS, . . . applying to the various quadrants?

EMERGENCY TIPS FOR PILOTS, MECHS

Leading accident prevention authorities state that most close calls, incidents, forced landings, . . . have the same contributing ingredients. as full-fledged major accidents. For what others did to get into emergencies, and how they handled the situation, check the FLIGAs appearing regularly in the maintenance section of *Approach*.

Your're right—NO STEP!

VOR AIRWAY SEPARATION CRITERIA

A reminder on an old subject: The center lines of VOR airways 15 degrees apart at a distance of 15 miles from a common facility are only 4 miles apart. ATC can legally separate two aircraft at the same altitude by this margin. This requires pilot skill in getting on course within 15 miles of a facility. If there is a case where this is not practical as a procedure, report it to . . . the proper ATC authorities . . . Special cases can be alleviated. — *ALPA — "Technical Talk for Pilots" 57-5*

GCA FINAL APPROACHES

In discussing OpNav Inst 3721.1A and the positioning of the chase pilot for single-pilot aircraft instrument practice, it was the opinion of the FAirAlameda Council that, with proper briefing of GCA personnel, added safety can be obtained by the chase pilot executing a crossover/under in the event that he wishes to terminate a GCA run because of an unsafe situation. The GCA final controller, upon observing the crossover to the inside, will immdiately tell the hooded pilot to take a waveoff, go contact, and will then unkey his microphone to allow for instructions by the chase pilot.

In addition, the GCA controller should, during the final approach, unkey his microphone whenever possible to allow the chase pilot to transmit if necessary. This procedure is being submitted as a proposed change to the OpNav Inst.

LIQUID BREATHING OXYGEN DESIGNATION

Hereafter "Lq. Ox." is the abbreviation for liquid breathing oxygen, according to BuAer. The designation, "*Lq. Ox.*", issued in USAF and USN Radio Facility Charts, VOR Edition No. 19 dtd 6 Oct 1956 "*LOX*", is used to designate low pressure oxygen systems. Hence the abbreviation for liquid breathing oxygen seems justified, BuAer notes.

OLD PRO CLUB

LTJG R. G. SONNIKSEN

Aircraft: F3H-2N, VF-14

Shortly after a night catapult launch, LTJG SONNIKSEN experienced an engine nozzle failure which resulted in a partial loss of power. A successful emergency afterburner light-off was accomplished on his fourth attempt by holding depressed a circuit breaker which had popped on each previous actuation of the system. He then made an uneventful night mirror landing utilizing emergency afterburner modulation. This is believed to be the first emergency afterburner landing performed on a carrier.

LTJG C. P. MAYS

Aircraft: AD-5W, VAW-12

At 7000 feet, approximately 8 miles from his carrier, partial engine failure left LTJG MAYS with only 15 inches of manifold pressure available. He broadcast "Mayday," switched to emergency IFF, alerted his crew and set up a glide for the ship. An emergency pull forward provided a ready deck aboard the USS *Randolph* in less than six minutes. LTJG MAYS planned a long straight-in approach from 3000 feet, two miles astern. He made three S-turns into the groove and came aboard with the LSO holding a roger all the way.

LT H. B. SOUTHWORTH

Aircraft F2H-3, VF-171

On a night landing aboard an angled deck carrier, LT SOUTHWORTH caught an arresting cable which parted after traveling a few feet. His plane slowed to 105 knots by the partial arrestment, swerved 40 degrees to the left and continued over the side. With full power already on, LT SOUTHWORTH eased the nose over, built up flying speed, and recovered just a few feet off the water. He flew the plane to the nearest NAS, determined that it had a high stalling speed, and made a successful landing. The whipping of the arresting cable had ripped the wing and left one flap dangling.

Recognition of heads-up flying is essential to a positive program of flight safety. From time to time, Approach acknowledges individuals whose exhibited flying ability merits membership. Old Pro's also receive a wallet membership card as a memento of the occasion. Commanding officers are invited to submit nominations for selection.

parachute RIGGER

Long gone are the days when your Parachute Rigger was limited to packing parachutes.

The complexity of modern high-performance aircraft has given him an entire family of new safety and survival equipment to maintain (for YOUR use). The equipment associated with the A4D, for instance, is only a part of that large and complex family, which covers the range from the CO^2 cartridge in your Mae West to the twenty-man raft in your R6D.

Today's Parachute Rigger is solely responsible for the proper stowage and functioning of your oxygen mask, oxygen test gear, regulators, high-pressure and liquid oxygen containers and transfer equipment, pressure suit, poopy suit, aneroid, life jacket, safety belt, shoulder harness, auto lap belt, ...

The Parachute Rigger's job is YOUR survival, your safety. His only reward is seeing your emergency equipment work for you, and yet, like yourself, he'd rather not see you need it. He still has to assume you'll need it on every flight.

He wonders and dreams about some future day when you'll turn your cockpit over to a black box full of transistors—"maybe then," says he, "I'll have time to make that tarpaulin for the skipper's motor scooter and sew that gold tiger onto the safety officer's flight jacket." Until that day comes your Parachute Rigger will be content with an occasional pat on the back—has he gotten one from YOU lately?